

GENERAL NOTES

GENERAL

3. All Items of work required to complete the work as shown or implied by the plans and as specified in the contract documents which are not listed as a pay item in the proposal shall be considered subsidiary.
5. Where existing Improvements Including, but not limited to, fences, driveways, sidewalks, pavement, curbs, utility pipelines and drainage structures are cut, broken, or damaged, the contractor shall replace or repair with the same type of original material and construction as approved by the Engineer. NO SEPARATE PAY ITEM
6. The Contractor and City Inspector shall document the preconstruction conditions at each location with photographs and/or video. NO SEPARATE PAY ITEM
7. The Contractor is completely responsible for the verification of the accuracy of the dimension control furnished herein. Any discrepancies found by the contractor shall be reported in writing to the Engineer immediately for reconciliation.
8. The Contractor shall contact Texas Excavation Safety System (800-DIG-TESS; 800-344-8377) and relevant utility companies 48 hours prior to locating existing utilities and/or construction activities.
9. The Contractor shall preserve and protect all existing utilities at all times during construction. Any damage to utilities resulting from the Contractor's operation shall be restored at his expense.
10. The Contractor shall support telephone conduits, storm drains, water and wastewater mains when going under said utilities. NO SEPARATE PAY ITEM.
11. Power poles may have to be braced at the Contractor's expense.
13. The Contractor shall secure all necessary permits before any work may begin. All permit fees shall be incidental to pay items provided.
14. The Contractor shall contact the engineer should any discrepancies be found in the construction plans and/or special provisions. The contractor will not be compensated for any work not authorized by the Engineer.
15. If cultural resources (archeological findings unearthed) are located during construction, work shall stop immediately in that area and Owner shall be notified.
17. For any projects impacting Park property, the Contractor shall coordinate with the Parks and Recreation department for establishment of any staging areas and access routes at least 1 month prior to beginning any construction. NO SEPARATE PAY ITEM.

ENVIRONMENTAL

1. No excess excavated material shall be deposited in low areas or along any natural drainage way without written permission from the Engineer. If the Contractor places excess material in areas without written permission, damage resulting from such fill will be the responsibility of the Contractor. Such fill material shall be removed at Contractor's own cost and the area shall be restored to equal or better than original condition. NO SEPARATE PAY ITEM
2. All waste material and/or excess excavation not used as part of the work shall be removed from the job site and disposed of in a timely manner at acceptable locations in accordance with all local, state and federal regulations. NO SEPARATE PAY ITEM.
3. The Contractor shall have an on-site spill response kit. Construction personnel shall be trained on how to use the spill response kit. The contractor shall meet the requirements of the City of Dallas environmental policy. No spills will be allowed to enter the storm drainage system.
4. The Contractor is responsible for keeping streets and sidewalks adjacent to the project free of mud and debris from construction at all times.
5. The Contractor is responsible for maintaining slope stability during construction for all sites. NO SEPARATE PAY ITEM.

TREES AND LANDSCAPING

1. Contractor shall not damage or remove any trees or landscaping unless otherwise authorized by the Owner. Any trees or landscaping that are damaged or removed during the construction shall be replaced by the contractor at his expense.
2. Contractor is responsible for protecting trees as specified in the drawings. NO SEPARATE PAY ITEM.
3. Any tree smaller than 6" that is to be removed is considered clearing and grubbing and shall be paid through a clearing and grubbing bid item. If it exists. Otherwise, it is NO SEPARATE PAY ITEM and shall be considered general site preparation.
4. Removal of snag and fallen trees that obstruct the path of proposed improvements shall be incidental to clearing and grubbing. NO SEPARATE PAY ITEM.
5. All waste material and/or excess excavation not used as part of the work shall be removed from the job site and disposed of in a timely manner at acceptable locations in accordance with all local, state and federal regulations. NO SEPARATE PAY ITEM.
6. The pay limit for grass spot or block sodding replacement due to construction shall be 2 feet outside the excavated trench. All other grass damaged or destroyed during this installation shall be replaced at the sole expense of the Contractor, unless otherwise indicated.
7. Areas disturbed by construction staging and access shall receive minimum of 4-inch topsoil and seeded and irrigated to establish vegetation. Maintenance and irrigation shall continue until 70 percent vegetation coverage is achieved for all disturbed areas or to the satisfaction of the Owner. NO SEPARATE PAY ITEM.

WATER MAIN AND APPURTENANCES

1. All 6", 8" and 12" water mains shall be PVC C900 (DR-14) water pipe, with Class "C" embedment, except as noted.
2. All water mains with no profiles shall have a minimum cover of four (4) feet below street grade in an improved street and five (5) feet of cover in an unimproved street or alley.
3. Compact fittings are not authorized for this project. All ductile iron pipe, fittings and fire hydrant bases shall be poly-wrapped.
4. All bends, tees fire hydrants and plugs are to be restrained type fittings and to be blocked with Class "B" Concrete as per DWU Standard Drawings *229-234, in addition to restrained joints.
7. The Contractor will ensure that fire hydrants are accessible to fire trucks at all times. NO SEPARATE PAY ITEM.
8. The Contractor shall sequence his construction such that no more than one fire hydrant is out of service at any given time.
10. Backfill made on break repairs to existing water mains may have been made with crushed rock. This could present a cave-in danger to a new ditch; therefore, precautions should be taken by the Contractor. NO SEPARATE PAY ITEM.
11. Abandon all water valves on existing mains being killed as per DWU Standard Drawing *219. NO SEPARATE PAY ITEM.
13. The Contractor shall verify the location and number of all existing active water services and construct new services up to the meter prior to killing existing main.
14. Water services greater than 30 feet shall be a minimum of one (1) inch in diameter.

WASTEWATER MAIN AND APPURTENANCES

1. The Contractor shall maintain existing wastewater flow at all times. NO SEPARATE PAY ITEM.
2. All manholes on abandoned wastewater mains shall be abandoned. NO SEPARATE PAY ITEM.
3. The Contractor shall verify the location of all wastewater laterals and construct new laterals from the wastewater main to the property line with cleanouts and reconnect to the existing laterals. Dye testing maybe required at no additional cost to the owner.
4. The backfill around manholes located in existing or new pavement shall be flowable backfill as per NCTCOG Specification Item 6.2.10(G). NO SEPARATE PAY ITEM.

STORM DRAIN AND APPURTENANCES

1. The Contractor shall maintain positive drainage at all times. Any temporary drainage measures shall meet or exceed the capacity of the existing drainage systems and are incidental to construction. NO SEPARATE PAY ITEM.
2. All manholes on abandoned stormwater mains shall be abandoned. NO SEPARATE PAY ITEM.
3. All storm drain pipes shall be Class III reinforced concrete pipes per ASTM C76 unless otherwise indicated.
4. The backfill around manholes located in existing or new pavement shall be flowable backfill as per NCTCOG Specification Item 6.2.10(G). NO SEPARATE PAY ITEM.
5. All storm drain boxes shall be precast reinforced concrete boxes per ASTM C1577-15 unless noted otherwise in the Contract Documents. At no additional cost to the Owner, the Contractor may provide alternative designs for precast reinforced concrete boxes and utilize precast concrete boxes fabricated in accordance with said design. If provided by the Contractor, the precast concrete boxes shall be designed in accordance with 1) ASTM C1577-15, and 2) the recommendations listed in the applicable geotechnical engineering studies. In addition, the concrete box designs shall account for forces associated with the following (as appropriate): depth of installation, hydrostatic pressures, HS-20 traffic live loads, installation methods such as jacking, and all other applicable forces. The designs shall also address all penetrations and connections. The shop drawing submittal shall be prepared under the supervision of a Professional Engineer licensed in the State of Texas and competent in designing precast concrete boxes, 2) be sealed by said Engineer, and 3) include the basis of design.
6. All storm drain wyes shall be plain fabricated (no splice); no field connections are allowed unless otherwise indicated on the plans. NO SEPARATE PAY ITEM.
7. All storm drain wyes shall be 60 degrees unless otherwise indicated on the plans.
8. Storm drain lines shall be video inspected at the end of the project and prior to final acceptance. Contractor shall note and correct all deficiencies.

ENCASEMENT PIPE AND B.O.T.O.C.

1. Tunnel linear plate or steel encasement pipe shall be designed by the contractor to suit his construction and pipeline installation methods. The Contractor shall submit a design confirming the adequacy of thickness for the linear plate or steel encasement pipe and sealed by a Professional Engineer licensed in the State of Texas.
2. Tunnel linear plate shall be hot dip galvanized and coated with bituminous coating as per Items 2.12.19(e) and 2.12.19(f) of COG.
3. Grout shall be applied to all voids between the carrier pipe and the encasement pipe.
4. In tunnel sections, voids between earth or rock and encasement pipe shall be filled in with 2:7 grout including 5% air entrainment by pressure injection.
5. Carrier pipe shall be supported on a continuous 6" thick class "B" concrete cradle within corrugated metal and flanged liner encasements. See detail on DWU Std. Dwg. *108.
6. Construct tapered concrete tunnel approach at each end of the encasement pipe. See detail on DWU Std. dwg.*108
7. When standard pipe is made up inside large encasement pipe, the carrier pipe shall be laid to grade on a class "B" concrete cradle which shall extend to the point of the diameter of the carrier pipe.
8. Where circumstances necessitate the excavation of a bore pit or trench close to the edge of the pavement, a guard fence or another approved protective device shall be installed for the protection of the travelling public.
9. The Contractor shall be responsible for conducting a settlement monitoring program for the duration of the work. NO SEPARATE PAY ITEM.

EROSION CONTROL NOTES

1. PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION, EROSION CONTROL DEVICES AS SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATION FOR THE PROJECT.
2. IF THIS EROSION CONTROL PLAN AS APPROVED CANNOT CONTROL EROSION, THE EROSION CONTROL PLAN WILL BE REQUIRED TO BE REVISED AND/OR ADDITIONAL EROSION CONTROL DEVICES WILL BE REQUIRED ON THE SITE.
3. AT A MINIMUM, PERIMETER CONTROLS SUCH AS SILT FENCE SHALL BE INSTALLED AT ALL DOWN SLOPE BOUNDARIES AND AS WARRANTED WHERE PAVEMENT REMOVAL, UTILITY CONSTRUCTION, GRADING OR OTHER CONSTRUCTION ACTIVITIES ARE TO BE PERFORMED.
4. THE CONTRACTOR SHALL AT ALL TIMES TAKE SUCH MEASURES AS NECESSARY TO MINIMIZE OFFSITE TRACKING OR SHALL BE IMMEDIATELY CLEARED BY THE CONTRACTOR.
5. ALL TREES THAT ARE NOT REMOVED ARE TO BE PROTECTED.
6. AT THE COMPLETION OF PAVING AND FINAL GRADING, THE DISTURBED AREAS SHALL BE RE VEGETATED IN ACCORDANCE WITH THE PLANS.
7. SILT FENCE AND INLET SEDIMENT BARRIERS SHALL REMAIN IN PLACE UNTIL THE RE VEGETATION HAS BEEN COMPLETED.
8. DISTURBED AREAS THAT ARE SEEDED OR SODDED SHALL BE CHECKED PERIODICALLY TO SEE THAT GRASS COVERAGE IS PROPERLY MAINTAINED. DISTURBED AREAS SHALL BE WATERED, FERTILIZED AND RE SEEDED OR SODDED, IF NECESSARY.
9. ALL STOCKPILED SOILS WILL BE SURROUNDED BY SILT FENCE, SEDIMENT CONTROL SWALE, OR SIMILAR MEASURE AS APPROVED BY THE ENGINEER, TO PROPERLY CONTROL SEDIMENT RUNOFF.
10. IF SITE SOIL BORROW OR SPOIL SITES ARE USED IN CONJUNCTION WITH THIS PROJECT, THIS INFORMATION SHALL BE DISCLOSED AND SHOWN ON THE EROSION CONTROL PLAN. OFF SITE BORROW AND SPOIL AREAS ARE CONSIDERED A PART OF THE PROJECT SITE AND THEREFORE SHALL COMPLY WITH EROSION CONTROL REQUIREMENTS. THESE AREAS SHALL BE STABILIZED WITH PERMANENT GROUND COVER PRIOR TO FINAL APPROVAL OF PROJECT.
11. DAMAGES TO ADJACENT PROPERTY OR THE RECEIVING WATERS CAUSED BY IMPROPERLY INSTALLED OR POORLY MAINTAINED EROSION CONTROL MEASURES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY SILTATION CAUSED BY HIS OPERATIONS AND/OR FAILURE OF THE EROSION CONTROL MEASURES.
13. INSPECTIONS OF EROSION CONTROL DEVICES SHALL BE MADE WEEKLY AND AFTER RAIN EVENTS TO ENSURE THAT THE DEVICES ARE FUNCTIONING PROPERLY. WHEN SEDIMENT OR MUD HAS CLOGGED THE VOID SPACES BETWEEN STONES OR MUD IS BEING TRACTED ONTO A PUBLIC ROADWAY, THE AGGREGATE PAD MUST BE WASHED DOWN OR REPLACED. RUNOFF FROM THE WASHDOWN OPERATION SHALL NOT BE ALLOWED TO DRAIN DIRECTLY OFFSITE WITHOUT FIRST FLOWING THROUGH ANOTHER BMP TO CONTROL OFFSITE SEDIMENTATION, PERIODIC REGRADING OR THE ADDITION OF NEW STONE MAY BE REQUIRED TO MAINTAIN THE EFFICIENCY OF THE INSTALLATION.
14. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ACCUMULATED SILT AND SEDIMENT FROM EROSION CONTROL MEASURES WHEN IT REACHES A DEPTH OF SIX (6) INCHES OR IMPAIRS THE EFFECTIVENESS OF THE MEASURES.
15. THE CONTRACTOR SHALL STABILIZE ANY AREA WHERE CONSTRUCTION ACTIVITY IS TO BE TEMPORARILY OR PERMANENTLY CEASED FOR MORE THAN 14 DAYS.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTAL OF N.O.I., N.O.T., AND ANY ADDITIONAL INFORMATION REQUIRED BY THE EPA AND TCEQ. CONTRACTOR SHALL COMPLY WITH ALL EPA AND TCEQ STORMWATER POLLUTION PREVENTION REQUIREMENTS.

TRAFFIC CONTROL

1. The Contractor shall maintain proper barricades and safety measures for the protection of the travelling public during the construction of this project.
5. Two - way traffic shall be maintained at all times and flagmen should be used to maintain two-way traffic as necessary.
6. When closing side streets, two working days notification is required for Fire, Police, Streets and Sanitation Departments. Please contact Gary Maxwell at 670-5896 or mobile 683-5189 to notify traffic restrictions.
7. Contractor shall maintain access to private driveways at all times during construction. NO SEPARATE PAY ITEM.
8. Vehicular Ingress and egress (entrance and exit) to a business property shall be maintained at all times. If not, specific signs along with business name and direction arrow(s) shall be used for any temporary access locations. Additional signs may be necessary if there is a detour. NO SEPARATE PAY ITEM.

PAVEMENT

1. Sawcut, remove and replace pavements, sidewalks, curbs and gutters shall conform to City Of Dallas Public Works & Transportation, Pavement Cuts & Repair Standards Manual, Latest Edition.
3. The Contractor shall notify the Owner at least 24 hours in advance of any concrete-placing or asphalt-laying operation.
4. All dimensions are to face of curb or edge of pavement where there is no curb, unless otherwise noted.
5. The Contractor shall submit to the Owner the complete concrete mix (batch design(s)) for review prior to the start of any concrete placing operations.
6. All reinforcing steel and dowel bars in pavement shall be supported and maintained at the correct clearances by the use of bar chairs or other approved support.
7. Drive approaches damaged by the Contractor shall be removed and replaced to match pre-construction conditions or better. Storm drain pipe under the drive approaches damaged by the Contractor shall be replaced or repaired to equal or better than pre-construction condition. NO SEPARATE PAY ITEM.

CONSTRUCTION PHASING

1. Proposed storm drain lines "D" and "E" are noted as a second phase of construction.
2. Proposed storm drain lines "A", "B", "C" and "F" will be build in Phase I.

CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

Sample 01 | Sheet 1 of 25

Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party sheets included for context.

GENERAL LEGENDS

GENERAL

	Benchmark
	Control Point
	Iron Pin Found
	Iron Pin Set
	Exlst. Minor Contour Line
	Exlst. Major Countour Line
	Prop. Minor Contour Line
	Prop. Major Contour Line
	Exlst. ROW
	Prop. ROW
	ROW Centerline
	Alley ROW
	Block Line
	Lot Line
	Exlst. Easement
	Prop. Easement
	Corporation Line Marker
	Exlst. Structure/Building
	Prop. Structure/Building
	Underground Structure/Building
	Bank/Slope Line
	Flow Line/Stream Line
	Bore Hole

PAVEMENT

	Exlst. Gravel
	Exlst. Asphalt
	Exlst. Brick
	Exlst. Concrete
	Prop. Pavement

UTILITIES

	Exlst. Gas Line
	Exlst. Gas Manhole
	Exlst. Underground Electric Line
	Exlst. Overhead Electric Line
	Exlst. Electric Pad Mounted Transformer
	Exlst. Electric Power Pole
	Exlst. Electric Pole Anchor
	Exlst. Electric Utility Manhole
	Exlst. Electric Vault
	Exlst. Telephone Line
	Exlst. Telephone Utility Manhole
	Exlst. Telephone Pedestal
	Exlst. Fiber Optic Line
	Exlst. Fiber Optic Manhole
	Exlst. Cable TV Line
	Exlst. Cable TV Manhole

WATER MAINS & APPURTENANCES

	Exlst. 6" Water Main
	Exlst. 8" to 27" Water Main
	Exlst. 30" or Larger Water Main
	Prop. 6" Water Main
	Prop. 8" to 27" Water Main
	Prop. 30" or Larger Water Main
	Future Water Main
	Exlst. Water Meter
	Exlst. Water Manhole
	Exlst. Water Vault
	Exlst. Fire Hydrant
	Prop. Water Manhole
	Prop. Water Vault
	Prop. Fire Hydrant
	Exlst. 11.25" Fitting
	Exlst. 22.5" Fitting
	Exlst. 45" Fitting
	Exlst. 90" Fitting
	Exlst. Reducer
	Exlst. Tee
	Exlst. Tapping Sleeve
	Exlst. Cross
	Exlst. Plug
	Exlst. Blind Flange
	Cut & Plug
	Prop. 11.25" Fitting
	Prop. 22.5" Fitting
	Prop. 45" Fitting
	Prop. 90" Fitting
	Prop. Reducer
	Prop. Tee
	Prop. Tapping Sleeve
	Prop. Plug
	Prop. Blind Flange
	Exlst. Gate Valve
	Exlst. High/Low Valve
	Exlst. Check Valve
	Exlst. Flush Point
	Exlst. Air Valve
	Exlst. Cathodic Test Station
	Prop. Gate Valve
	Prop. High/Low Valve
	Prop. Check Valve
	Prop. Flush Point
	Prop. Air Valve
	Prop. Cathodic Test Station

WASTEWATER MAINS & APPURTENANCES

	Exlst. 6" to 27" Wastewater Main
	Exlst. 30" or Larger Wastewater Main
	Prop. 6" to 27" or Larger WW Main
	Prop. 30" or Larger Wastewater Main
	Exlst. Wastewater Manhole
	Exlst. Wastewater Access Device
	Exlst. Wastewater Cleanout
	Prop. Wastewater Manhole
	Prop. Wastewater Access Device
	Prop. Wastewater Cleanout
	Remove & Replace Exst. Manhole

STORM DRAIN & EROSION CONTROL

	Exlst. Storm Drain Smaller than 18"
	Exlst. 18" or Larger Storm Drain
	Exlst. Storm Manhole
	Exlst. Storm Inlet
	Prop. Storm Drain Smaller than 18"
	Prop. 18" or Larger Storm Drain
	Prop. Storm Manhole
	Prop. Storm Inlet
	Remove and Replace Ex. Storm Manhole
	Remove and Replace Ex. Inlet
	Prop. Gabion Basket/Mattress
	Prop. Stone RipRap
	Prop. Flexamat
	Prop. Geomat
	Prop. Anchor
	Prop. Sodding

TOPOGRAPHIC FEATURES

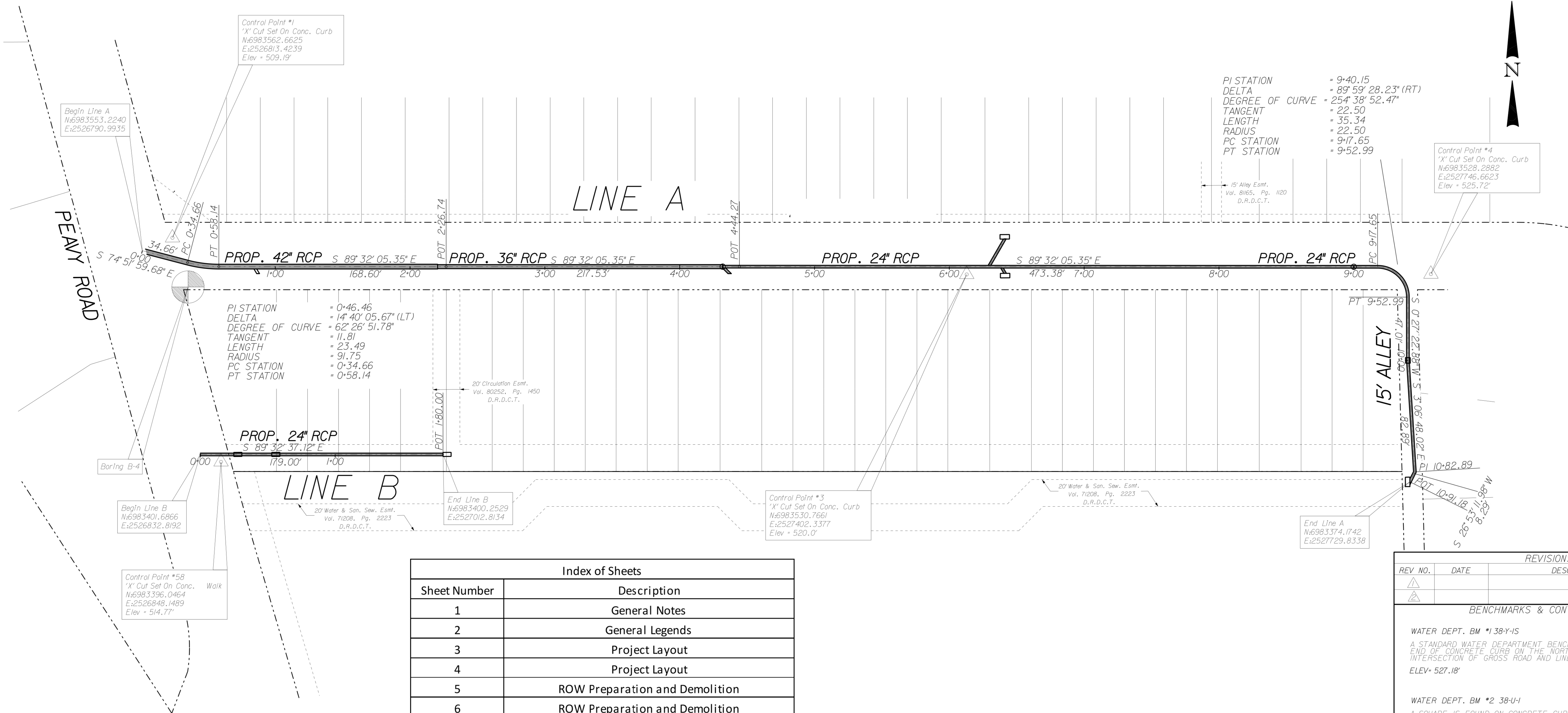
	Exlst. Tree
	Exlst. Tree to be Removed
	Exlst. Tree to be Protected
	Brush, Shrub, Wood
	Swamp
	Mail Box
	Ballards
	Irrigation Control Valve
	Chain Link/Other Fence
	Wood Fence
	Wrought Iron Fence
	Brick Wall
	Concrete Wall
	Retaining Wall
	Parking Meter
	Traffic Sign
	Traffic Signal Pole
	Street Lamp
	Railroad, Each Track

CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

Sample 01 | Sheet 2 of 25

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REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
1			
2			

BENCHMARKS & CONTROL POINTS

WATER DEPT. BM #1 38-Y-15
A STANDARD WATER DEPARTMENT BENCHMARK IS FOUND 5' FROM END OF CONCRETE CURB ON THE NORTHEAST CORNER OF THE INTERSECTION OF GROSS ROAD AND LINDARO LANE.
ELEV= 527.18'

WATER DEPT. BM #2 38-U-1
A SQUARE IS FOUND ON CONCRETE CURB AT EXPANTION JOINT ON WEST SIDE OF SKYVIEW DRIVE AND APPROXIMATELY 50' FROM CENTERLINE OF FERGUSON ROAD.
ELEV= 533.18'

Horizontal Scale: 1" = 40'

0'40'80'

PRELIMINARY

FOR INTERIM REVIEW ONLY. NOT FOR PERMITTING, BIDDING, OR CONSTRUCTION.

Prepared by or under the direct supervision of

REFERENCES

STORM	WATER
SH. 441	33W-37
WASTEWATER	BH-J-10

CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

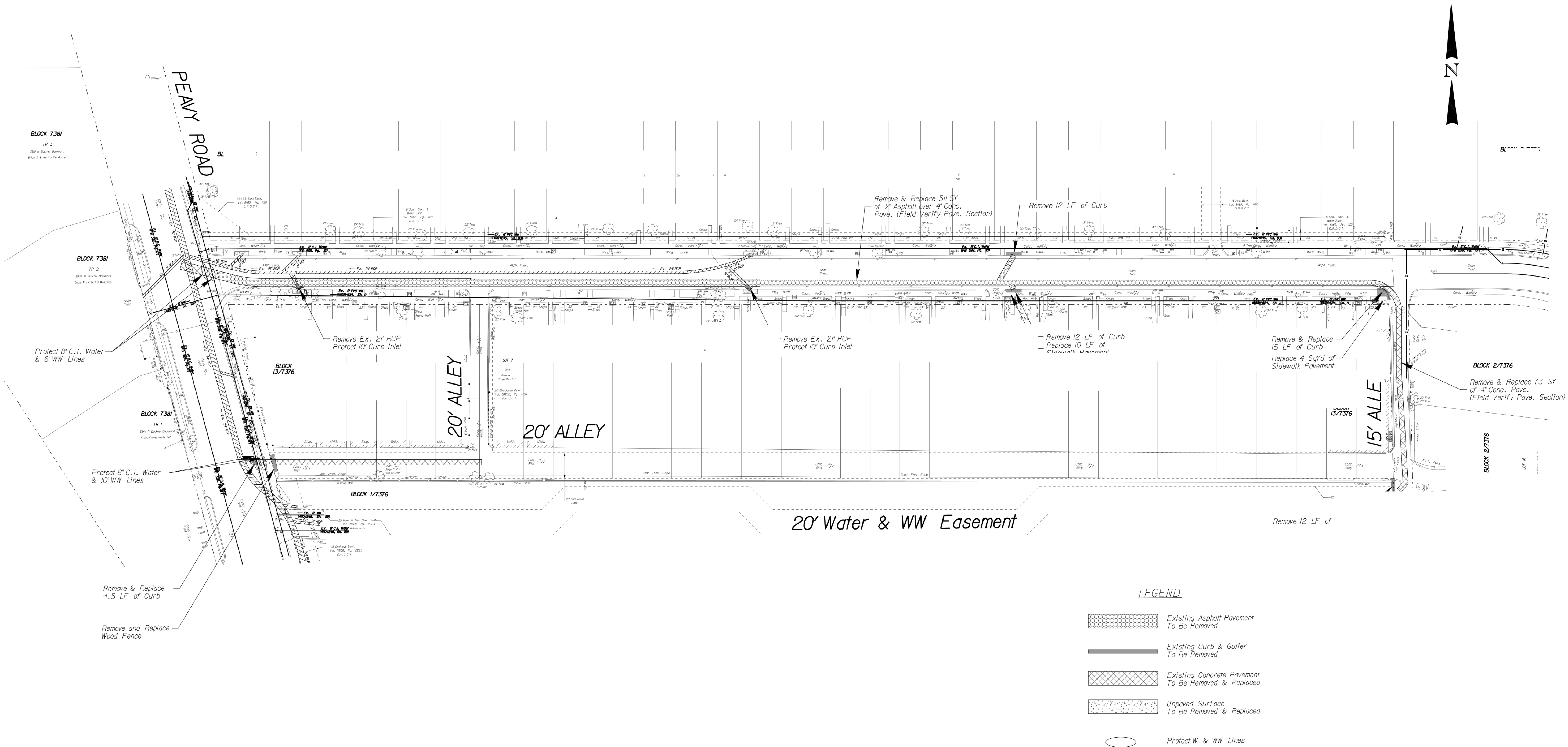
Sample 01 | Sheet 3 of 25

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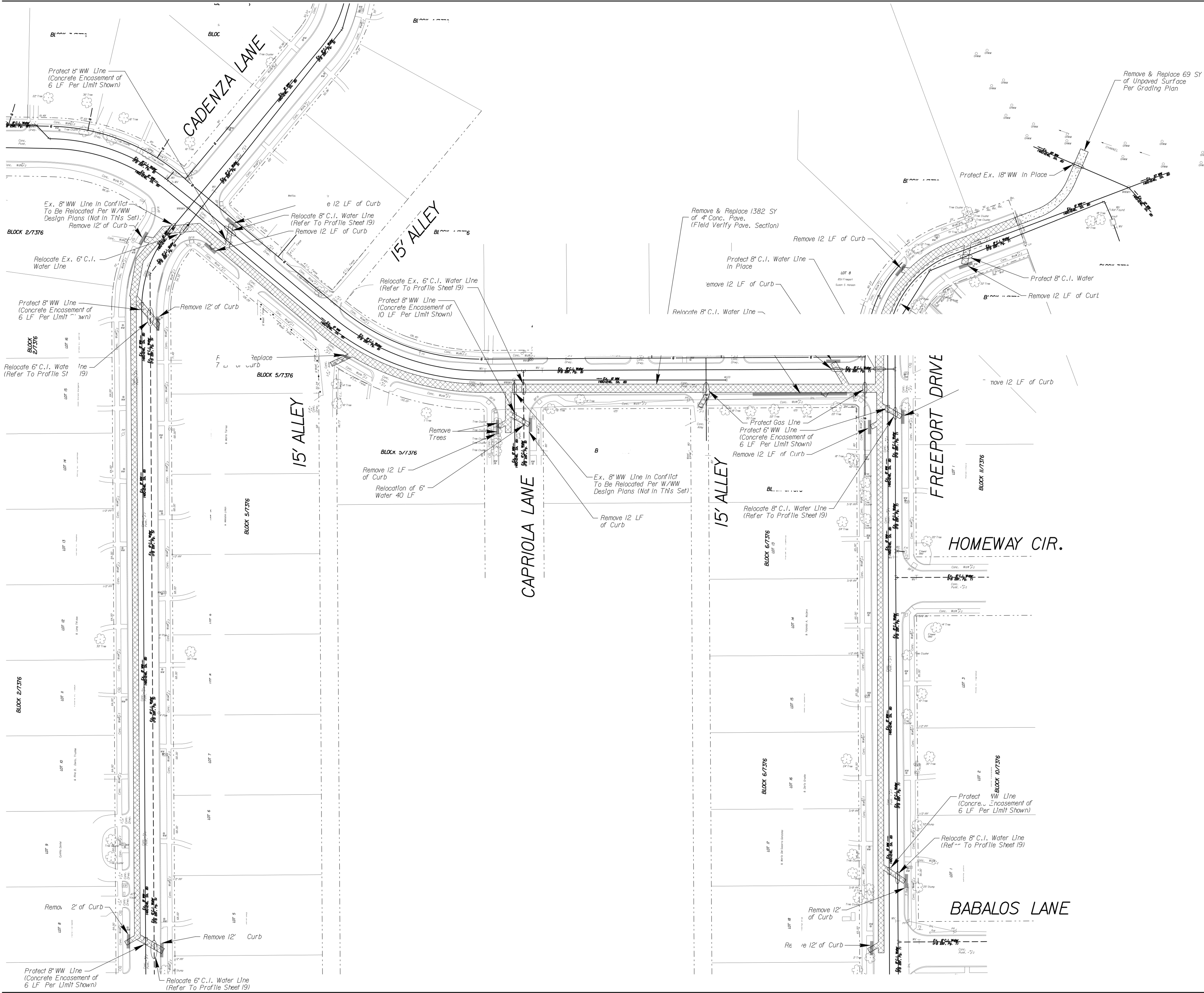


CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

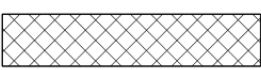
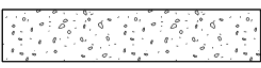
Sample 01 | Sheet 5 of 25

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LEGEND

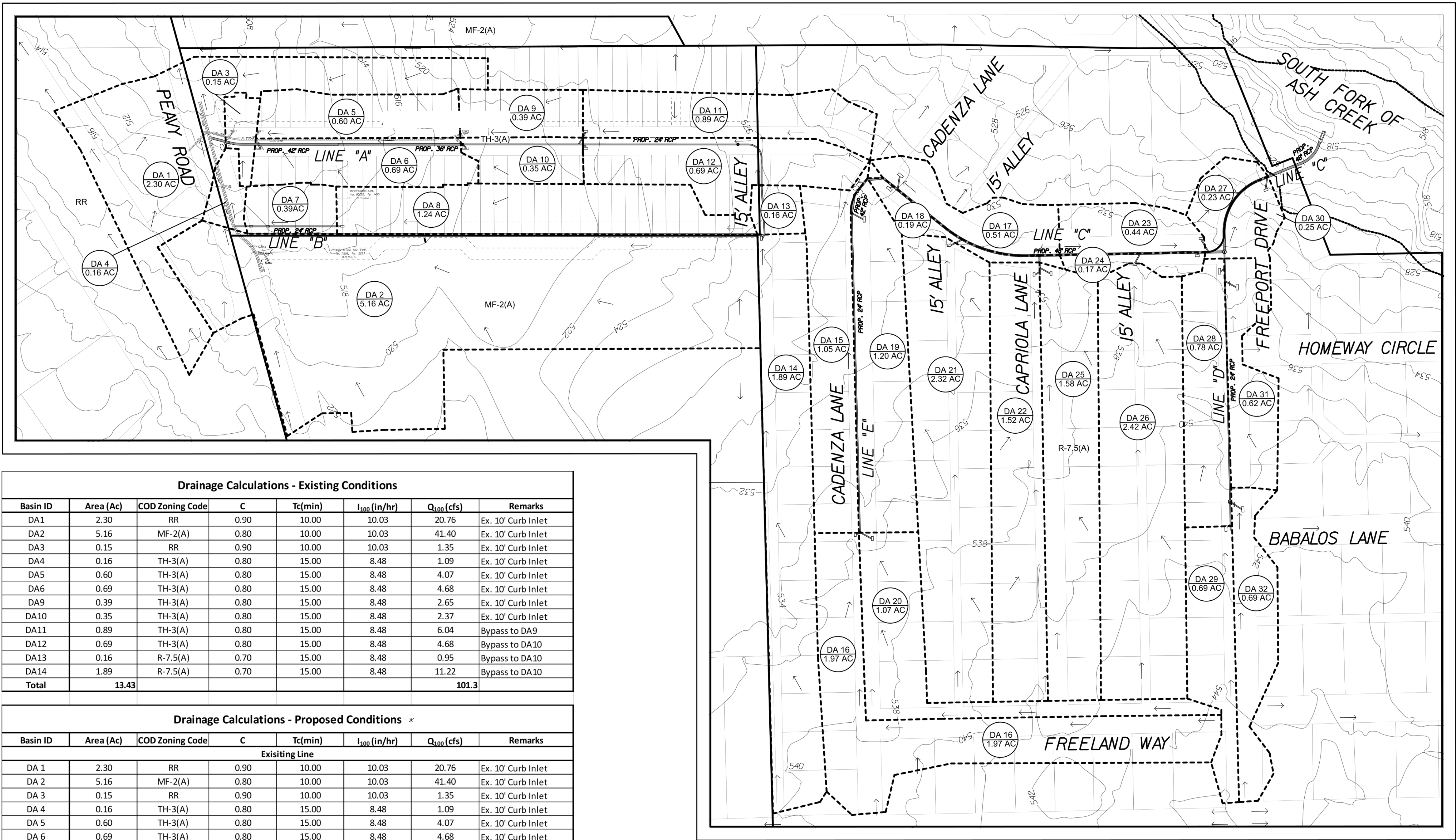
-  Existing Concrete Pavement To Be Removed & Replaced
-  Unpaved Surface To Be Removed & Replaced
-  Protect W & WW Lines

CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

Sample 01 | Sheet 6 of 25

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- LEGEND**
- Exlst. Storm Manhole
 - Exlst. Storm Inlet
 - Prop. Storm Manhole
 - Prop. Storm Inlet
 - Major Drainage Divide
 - FEMA 1% Flood Zone
 - Flow Direction
 - Drainage Area No.
0.14 AC
Drainage Area (Acres)
 - Zoning Divide

Drainage Calculations - Existing Conditions							
Basin ID	Area (Ac)	COD Zoning Code	C	Tc(min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	Remarks
DA1	2.30	RR	0.90	10.00	10.03	20.76	Ex. 10' Curb Inlet
DA2	5.16	MF-2(A)	0.80	10.00	10.03	41.40	Ex. 10' Curb Inlet
DA3	0.15	RR	0.90	10.00	10.03	1.35	Ex. 10' Curb Inlet
DA4	0.16	TH-3(A)	0.80	15.00	8.48	1.09	Ex. 10' Curb Inlet
DA5	0.60	TH-3(A)	0.80	15.00	8.48	4.07	Ex. 10' Curb Inlet
DA6	0.69	TH-3(A)	0.80	15.00	8.48	4.68	Ex. 10' Curb Inlet
DA9	0.39	TH-3(A)	0.80	15.00	8.48	2.65	Ex. 10' Curb Inlet
DA10	0.35	TH-3(A)	0.80	15.00	8.48	2.37	Ex. 10' Curb Inlet
DA11	0.89	TH-3(A)	0.80	15.00	8.48	6.04	Bypass to DA9
DA12	0.69	TH-3(A)	0.80	15.00	8.48	4.68	Bypass to DA10
DA13	0.16	R-7.5(A)	0.70	15.00	8.48	0.95	Bypass to DA10
DA14	1.89	R-7.5(A)	0.70	15.00	8.48	11.22	Bypass to DA10
Total	13.43					101.3	

Drainage Calculations - Proposed Conditions *							
Basin ID	Area (Ac)	COD Zoning Code	C	Tc(min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	Remarks
Exisiting Line							
DA 1	2.30	RR	0.90	10.00	10.03	20.76	Ex. 10' Curb Inlet
DA 2	5.16	MF-2(A)	0.80	10.00	10.03	41.40	Ex. 10' Curb Inlet
DA 3	0.15	RR	0.90	10.00	10.03	1.35	Ex. 10' Curb Inlet
DA 4	0.16	TH-3(A)	0.80	15.00	8.48	1.09	Ex. 10' Curb Inlet
DA 5	0.60	TH-3(A)	0.80	15.00	8.48	4.07	Ex. 10' Curb Inlet
DA 6	0.69	TH-3(A)	0.80	15.00	8.48	4.68	Ex. 10' Curb Inlet
DA 9	0.39	TH-3(A)	0.80	15.00	8.48	2.65	Ex. 10' Curb Inlet
DA10	0.35	TH-3(A)	0.80	15.00	8.48	2.37	Ex. 10' Curb Inlet
Total	9.80					78.38	
Proposed Line A							
DA 11	0.89	TH-3(A)	0.80	15.00	8.48	6.04	Prop. 10' Curb Inlet
DA 12	0.69	TH-3(A)	0.80	15.00	8.48	4.68	Prop. 10' Curb Inlet
DA 13	0.16	R-7.5(A)	0.70	15.00	8.48	0.95	Prop. 10' Curb Inlet
DA 14	1.89	R-7.5(A)	0.70	15.00	8.48	11.22	Prop. 10' Curb Inlet
Total	3.63					22.89	
Proposed Line B							
DA 7	0.30	TH-3(A)	0.80	15.00	8.48	2.04	Prop. 6'x4' Grate Inlet
DA 8	1.24	TH-3(A)	0.80	15.00	8.48	8.41	Prop. 6'x4' Grate Inlet
Total	1.54					10.45	
Proposed Line C							
DA 15	1.05	R-7.5(A)	0.70	15.00	8.48	6.23	Prop. 10' Curb Inlet
DA 17	0.51	R-7.5(A)	0.70	15.00	8.48	3.03	Prop. 10' Curb Inlet
DA 18	0.19	R-7.5(A)	0.70	15.00	8.48	1.13	Prop. 10' Curb Inlet
DA 19	1.20	R-7.5(A)	0.70	10.00	10.03	8.43	Prop. 10' Curb Inlet
DA 21	2.32	R-7.5(A)	0.70	10.00	10.03	16.29	Prop. 10' Curb Inlet
DA 22	1.52	R-7.5(A)	0.70	10.00	10.03	10.67	Prop. 10' Curb Inlet
DA 23	0.44	R-7.5(A)	0.70	15.00	8.48	2.61	Prop. 10' Curb Inlet
DA 24	0.17	R-7.5(A)	0.70	15.00	8.48	1.01	Prop. 10' Curb Inlet
DA 25	1.58	R-7.5(A)	0.70	15.00	8.48	9.38	Prop. 10' Curb Inlet
DA 26	2.42	R-7.5(A)	0.70	15.00	8.48	14.37	Prop. 10' Curb Inlet
DA 27	0.23	R-7.5(A)	0.70	15.00	8.48	1.37	Prop. 10' Curb Inlet
DA 30	0.25	R-7.5(A)	0.70	15.00	8.48	1.48	Prop. 10' Curb Inlet
Total	11.88					75.99	

Drainage Calculations - Proposed Conditions							
Basin ID	Area (Ac)	COD Zoning Code	C	Tc(min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	Remarks
Proposed Line D							
DA 28	0.78	R-7.5(A)	0.70	15	8.48	4.63	Prop. 10' Curb Inlet
DA 29	0.69	R-7.5(A)	0.70	15	8.48	4.10	Prop. 10' Curb Inlet
DA 31	0.62	R-7.5(A)	0.70	15	8.48	3.68	Prop. 10' Curb Inlet
DA 32	0.69	R-7.5(A)	0.70	15	8.48	4.10	Prop. 10' Curb Inlet
Total	2.78					16.50	
Proposed Line E							
DA 16	1.97	R-7.5(A)	0.70	15	8.48	11.69	Prop. 10' Curb Inlet
DA 20	1.07	R-7.5(A)	0.70	10	10.03	7.51	Prop. 10' Curb Inlet
Total	3.04					19.21	

* NOTE:
Q100 values represent surface discharge generated by each drainage area. Each Inlet captures some of this flow and excess flow is shown as bypass (for at grade inlets) to the next Inlet (sump or at-grade). Refer to the Inlet Summary Table on Sheet 8.

CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

Sample 01 | Sheet 7 of 25

Portfolio reference only.
Not for construction.

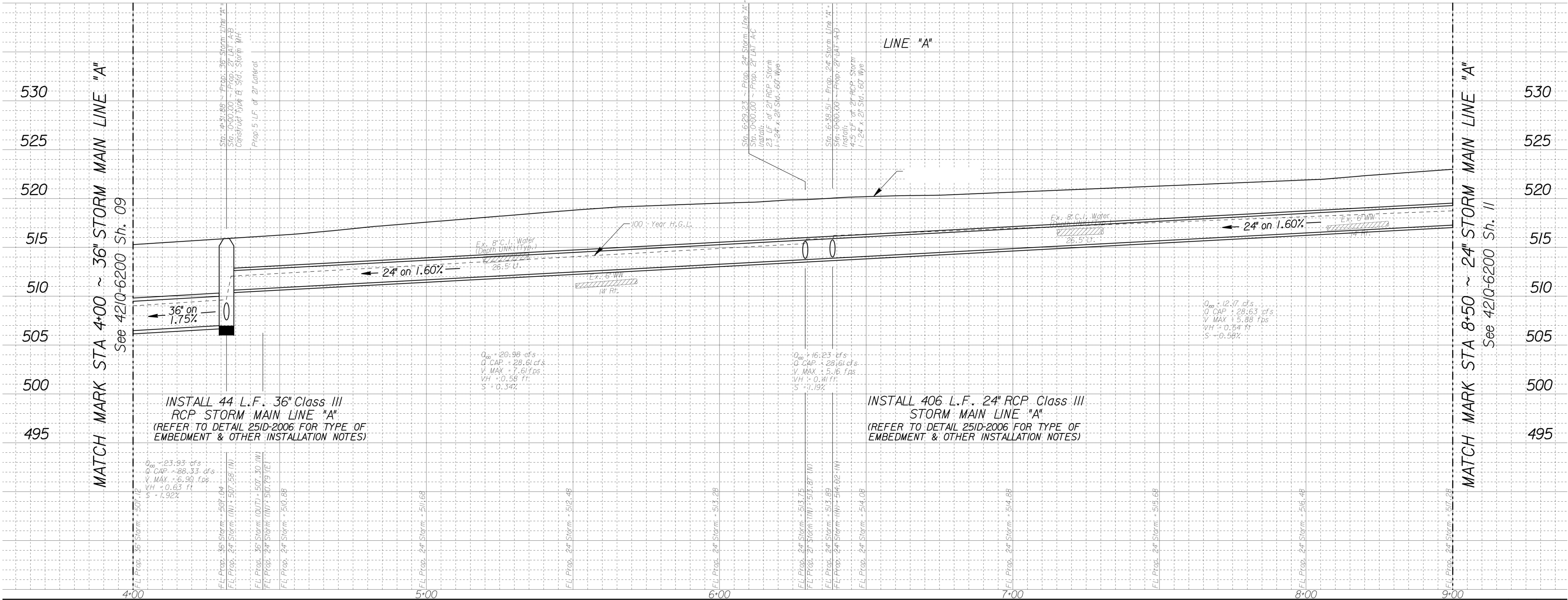
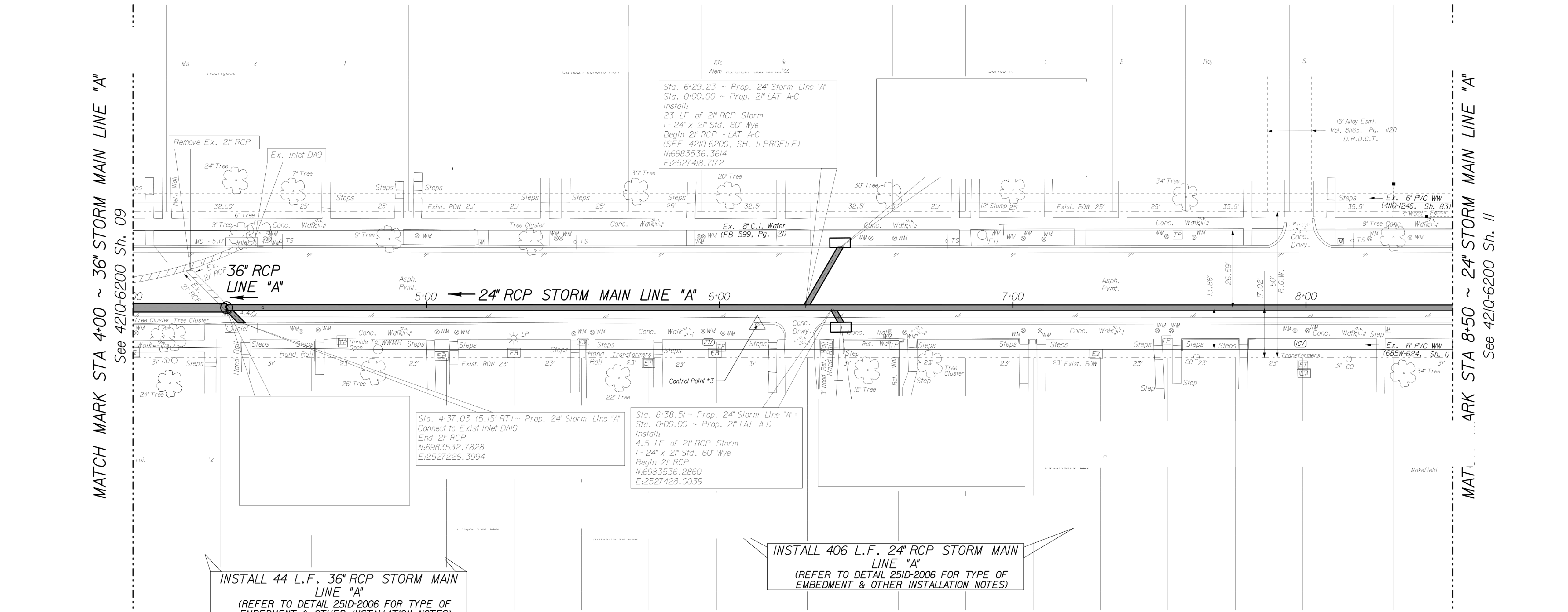
Production support under the client engineering team. Supporting third-party sheets included for context.

Storm Sewer and Hydraulic Grade Line Computations																			
Runoff Collection Point		Distance between collection points ft	100-VR cfs	Storm Water Runoff "Q"	Slope of Hydraulic Grading %	Sewer Size in	Velocity in Sewer ft/sec	Collection points n	Velocity Headloss V2/2g ft	Pipe				HGL		Data Verification			
Downstream Station	Upstream Station									U/S FL MSL	D/S FL MSL	Slope %	Area ft²	Qcap cfs	U/S MSL	D/S MSL	Top Grade or Rim EL at D/S MSL	Pipe Flow Condition	Top Grade - HGL
Existing Line on Peavy Rd																			
0+00	0+50	50.00	109.61	0.10	66.00	4.63	0.33	494.45	494.30	0.30	23.76	106.48	499.85	499.80	504.75	FULL	4.95	10.30	
0+50	1+50	100.00	109.61	0.92	60.00	8.97	1.25	495.95	494.95	1.00	19.63	250.48	498.93	499.85	504.75	FULL	5.65	9.55	
1+50	3+25	175.00	109.61	2.15	60.00	8.97	1.25	500.48	495.95	2.59	19.63	382.78	503.46	499.70	509.75	FULL	10.05	9.27	
3+25	3+35	10.00	79.64	4.60	54.00	8.33	1.08	501.25	500.98	2.70	15.90	422.50	504.32	503.96	510.00	FULL	6.14	8.75	
3+35	4+00	65.00	51.56	0.18	51.56	7.19	0.88	502.38	501.25	0.66	15.90	84.26	504.46	504.77	511.23	FULL	6.46	8.85	
4+00	5+05	72.00	50.48	2.57	54.00	7.14	0.79	504.90	502.37	3.51	15.90	316.07	506.95	505.10	514.22	FULL	9.12	9.32	
5+05	5+77	300.00	39.38	1.61	54.00	6.61	0.68	510.69	504.90	1.93	15.90	250.45	512.49	507.65	523.00	PART.	15.35	12.31	
Existing 30" RCP on Abshire Ln																			
0+00	0+35	345.00	3.61	1.72	24.00	3.95	0.24	510.05	501.71	2.42	3.14	29.76	510.71	504.77	515.80	FULL	11.03	5.75	
0+35	0+75	84.15	28.07	0.08	42.00	6.38	0.63	502.17	501.75	0.50	9.62	29.10	504.78	504.71	509.90	FULL	5.19	7.75	
0+75	4+20	136.25	23.93	0.06	42.00	6.06	0.57	502.85	502.17	0.50	9.62	24.44	505.29	505.21	510.00	FULL	4.79	7.19	
Proposed Line A																			
0+00	0+84.15	84.15	28.07	0.08	42.00	6.38	0.63	502.17	501.75	0.50	9.62	29.10	504.78	504.71	509.90	PART.	5.19	7.73	
0+84.15	2+20.40	136.25	23.93	0.06	42.00	6.06	0.57	502.85	502.17	0.50	9.62	24.44	505.29	505.21	510.00	PART.	4.79	7.75	
2+20.40	4+31.88	216.62	23.93	1.62	36.00	6.36	0.63	507.15	503.35	1.75	7.07	85.13	509.00	505.49	515.53	PART.	10.04	8.18	
4+31.88	4+44.27	12.39	20.98	1.92	36.00	6.09	0.58	507.30	507.15	2.07	7.07	92.67	509.65	509.00	515.72	PART.	6.72	8.43	
4+44.27	6+29.23	185.00	16.28	1.80	24.00	7.61	0.90	513.75	510.79	1.60	3.14	30.48	515.39	512.06	518.60	PART.	6.54	4.85	
6+29.23	6+38.51	8.25	20.93	0.34	24.00	5.16	0.41	513.89	513.75	1.60	3.14	13.45	515.89	515.86	521.00	PART.	5.14	7.11	
6+38.51	9+00	261.49	12.17	1.19	24.00	5.88	0.54	518.08	513.89	1.60	3.14	24.74	519.33	516.22	524.76	PART.	8.54	6.68	
9+00	9+50	50.00	12.17	0.58	24.00	5.88	0.54	518.68	518.08	1.20	3.14	17.28	519.93	519.64	524.98	PART.	5.34	6.30	
9+50	10+00	50.00	12.17	0.58	24.00	5.88	0.54	519.28	518.68	1.20	3.14	17.28	520.53	520.24	525.63	PART.	5.39	6.35	
10+00	10+88.41	88.00	9.89	0.61	24.00	5.44	0.46	520.34	519.28	1.20	3.14	17.77	521.46	520.92	527.00	PART.	6.08	6.66	
Lat. A-A																			
0+00	0+44	8.00	4.14	1.25	21.00	4.26	0.28	504.05	504.00	0.62	2.41	17.76	504.79	504.69	505.05	PART.	4.36	5.00	
Lat. A-B																			
0+00	0+20	20.00	2.95	2.75	21.00	3.85	0.23	511.17	510.80	1.85	2.41	26.35	511.79	511.24	516.17	PART.	4.93	5.00	
Lat. A-C																			
0+00	0+23	23.00	4.76	1.39	21.00	4.45	0.31	515.75	513.75	8.70	2.41	18.74	516.55	516.23	520.25	PART.	4.02	4.50	
Lat. A-D																			
0+00	0+20	20.00	4.06	0.35	21.00	2.98	0.14	515.37	514.02	6.75	2.41	9.40	516.34	516.41	519.87	PART.	3.46	4.50	
Inlet A-E																			
0+00	0+03	50.00	12.17	0.58	24.00	5.88	0.54	519.28	518.68	1.20	3.14	17.28	520.53	520.24	525.63	PART.	5.39	6.35	
Inlet A-F																			
0+00	0+03	3.00	9.89	25.29	21.00	5.79	0.52	522.44	520.46	66.00	2.41	79.90	523.61	521.66	526.94	PART.	5.28	4.50	
Proposed Line B																			
0+00	0+28	28.00	11.50	0.97	21.00	6.36	0.63	507.06	506.27	2.39	2.41	24.51	508.55	508.23	514.20	FULL	5.97	7.14	
0+28	0+56	28.00	10.22	2.17	21.00	4.53	0.32	506.27	507.69	2.72	2.41	26.22	509.31	508.80	514.69	FULL	5.89	8.42	
0+56	1+80	124.00	6.31	1.70	21.00	3.75	0.22	509.51	507.06	2.72	2.41	26.69	509.88	511.99	515.05	PART.	3.06	5.54	
Proposed Line C																			
0+00	0+50	50.00	73.39	0.26	48.00	5.84	0.53	515.15	515.00	0.30	12.57	78.39	520.37	520.24	522.50	FULL	2.26	7.35	
0+50	1+00	100.00	73.39	0.24	48.00	5.84	0.53	515.30	515.15	0.30	12.57	78.33	520.50	520.38	523.00	FULL	2.62	7.70	
1+00	1+31.55	31.55	73.00	0.25	48.00	5.84	0.53	515.69	520.61	0.29	12.57	68.27	520.69	520.61	524.00	FULL	3.39	8.61	
1+31.55	1+88.72	57.17	71.00	0.24	48.00	5.65	0.50	515.56	515.39	0.30	12.57	73.55	521.05	520.91	525.50	FULL	4.59	9.94	
1+88.72	3+09.17	63.28	68.27	0.22	48.00	5.43	0.46	515.75	515.56	0.30	12.57	84.84	521.10	521.26	528.00	PART.	6.74	12.25	
3+09.17	3+52.39	43.22	68.27	0.23	48.00	5.43	0.46	515.88	515.75	0.30	12.57	78.99	521.66	521.56	529.00	PART.	7.44	13.12	
3+52.39	3+79.13	26.74	58.09	0.19	48.00	5.99	0.56	519.07	519.00	0.26	12.57	79.09	521.95	521.90	530.00	PART.	8.10	10.93	
3+79.13	3+96.33	17.20	56.30	0.06	48.00	5.30	0.44	519.13	519.07	0.35	12.57	72.60	522.27	522.26	531.75	PART.	9.49	12.62	
3+96.33	4+95.53	99.20	55.38	0.10	48.00	5.93	0.44	519.43	519.13	0.30	12.57	73.04	522.53	522.43	532.30	PART.	9.87	12.87	
4+95.53	6+07.91	171.55	47.73	0.27	48.00	4.76	0.25	515.95	519.43	0.30	12.57	74.58	523.25	522.79	532.85	PART.	10.06	12.90	
6+07.91	7+02.08	135.00	40.55	0.81	48.00	6.89	0.74	520.49	519.95	0.40	12.57	85.30	523.56	523.45	532.20	PART.	8.75	11.71	
7+02.08	8+82.42	139.00	32.24	0.50	48.00	6.41	0.64	521.04	520.49	0.40	12.57	80.89	524.14	524.07	531.00	PART.	6.93	9.96	
8+82.42	9+91.19	20.00	6.21	0.25	48.00	6.21	0.60	521.08	521.04	0.40	12.57	80.85	524.58	524.27	538.54	PART.	4.27	7.48	
9+91.19	8+96.19	22.82	15.21	0.09	48.00	5.14	0.41	521.18	521.08	0.44	12.57	90.55	525.01	524.99	528.60	PART.	3.61	7.42	
8+96.19	9+14.01	10.00	15.21	0.10	42.00	5.29	0.43	521.68	521.64	0.40	9.62	90.57	525.03	525.02	528.55	PART.	3.53	6.67	
9+14.01	9+42.56	50.00	15.21	2.25	42.00	3.86	0.23	521.77	521.68	0.36	9.62	90.89	525.05	525.10	528.51	PART.	3.41	6.74	
9+42.56	9+75.31	26.30	11.02	0.15	42.00	4.82	0.36	521.87	521.77	0.38	9.62	60.37	525.35	525.30	528.42	PART.	3.12	6.55	
9+75.31	10+06.37	31.00	11.02	0.74	42.00	4.82	0.36	522.00	521.87	0.42	9.62	62.03	525.40	525.81	528.40	PART.	2.59	6.40	
Lat. C-A																			
0+00	0+20	20.00	2.38	1.45	21.00	3.61	0.20	521.12	516.52	23.00	2.41	19.13	521.68	521.39	528.00	PART.	6.61	6.88	
Lat. C-B																			
0+00	0+10	10.00	2.74	25.00	21.00	3.76	0.22	523.60	516.69	69.10	2.41	79.44	524.20	521.70	527.00	PART.	5.30	3.48	
Lat. C-C																			
0+00	0+34	34.00	1.78	14.21	21.00	3.33	0.17	527.05	519.07	23.47	2.41	59.88	527.53	522.70	531.55	PART.	8.85	4.50	
Lat. C-D																			
0+00	0+32	32.00	7.18	4.53	21.00	5.11	0.41	528.14	527.10	3.71	2.41	33.80	529.13	527.68	534.00	PART.	6.32	5.86	
Lat. C-E																			
0+00	0+36	36.00	7.65	17.81	21.00	5.23	0.45	528.42	520.56	21.83	2.41	67.04	529.44	523.03	532.92	PART.	9.89	4.50	
Lat. C-F																			
0+00	0+22	22.00	3.70	0.00	21.00	4.11	0.26	528.58	528.14	2.00	2.41	0.00	529.28	529.28	534.00	PART.	4.72	5.42	
Lat. C-G																			
0+00	0+32	32.00	8.31	8.31	21.00	5.40	0.45	527.22	525.09	6.66	2.41	45.81	528.29	525.63	531.00	PART.	5.37	3.78	
Lat. C-H																			
0+00	0+26	26.00	3.03	7.85	21.00	3.87	0.23	524.75	522.17	9.92	2.41	44.50	525.38	523.34	529.25	PART.	5.91	4.50	
Lat. C-I																			
0+00	0+26	26.00	14.00	12.69	21.00	6.84	0.73	524.76	522.10	9.81	2.41	56.60	526.15	522.85	529.00	PART.	6.41	4.50	
Lat. C-J																			
0+00	0+25	25.00	4.20	5.52	21.00	4.28	0.28	524.17	522.71	5.84	2.41	37.33	524.92	523.54	528.67	PART.	5.13	4.50	
Proposed Line D																			
0+00	0+13.67	13.67	10.18	1.24	24.00	4.50	0.37	526.26	526.17	0.66	3.14	25.30	527.40	527.24	529.00	PART.	1.46	2.50	
0+13.67	0+28.7	15.03	7.50	0.47	24.00	5.95	0.48	526.50	526.26	1.60	3.14	15.48	527.47	527.53	530.00	PART.	2.77	3.74	
0+28.7	4+04.42	375.72	4.60	0.04	24.00	4.25	0.28	530.61	526.50	1.09	3.14	22.02	531.36	527.83	534.00	PART.	6.18	3.48	
4+04.42	443.42	39.00	2.30	0.28	24.00	3.48	0.19	531.00	530.61	1.00	3.14	12.05	531.53	531.64	536.00	PART.	4.36	5.00	
Lat. D-A																			
0+00	0+22	32.00	8.31	8.31	21.00	5.40	0.45	527.22	525.09	6.6									

GUTTER FLOW / CURB INLETS AT GRADE COMPUTATIONS																						
INLET LOCATION		Q ₁₀ (cfs)	CO (cfs)	Q _a (cfs)	z	n	S _c (ft/ft)	S _c or S ₂ (ft/ft)	y (ft)	T (ft)	s (ft)	q _t (cfs/ft)	L _t (ft)	L _a (ft)	Ls/L _t	aly	Q/G _Q	Q (cfs)	Qa-Q ₁₀ (cfs)	CARRY OVER TO	REMARKS	
ID																						
Existing Conditions																						
DA1	Heavy Rd	20.77	0.00	20.77	82.64	0.013	0.02	0.01	0.30	25.00	0.42	0.76	27.49	20.00	0.73	1.38	1.00	20.77	0.00		Modeled as 20' curb inlet to capture all of DA1 flow.	
DA2	Heavy Rd	41.40	0.00	41.40	82.64	0.013	0.02	0.01	0.39	32.39	0.42	0.85	48.71	20.00	0.41	1.06	4.05	18.63	22.77		Modeled as 20' curb inlet to capture all of DA1 flow.	
DA3	Abshire Ln	1.35	0.55	1.90	82.64	0.013	0.02	0.01	0.12	10.20	0.42	0.58	3.27	10.00	3.05	3.08	1.00	1.90	0.00		Ex. 10' curb inlet.	
DA4	Abshire Ln	1.09	0.00	1.09	82.64	0.013	0.02	0.01	0.10	8.28	0.42	0.56	1.95	10.00	5.13	4.16	1.00	1.09	0.00		Modeled as 10' curb inlet to capture all of DA1 flow.	
DA5	Abshire Ln	4.07	0.32	4.39	82.64	0.013	0.02	0.01	0.17	13.96	0.42	0.62	7.05	10.00	1.42	2.47	1.00	4.39	0.00	DA1	Ex. 10' curb inlet.	
DA6	Abshire Ln	4.68	0.05	4.73	82.64	0.013	0.02	0.01	0.17	14.36	0.42	0.63	7.54	10.00	1.33	2.40	1.00	4.73	0.00	DA3	Ex. 10' curb inlet.	
DA7	Abshire Ln	2.92	1.28	4.20	82.64	0.013	0.02	0.01	0.13	13.39	0.42	0.62	6.37	10.00	1.57	2.52	1.00	3.93	0.00	DA5	Ex. 10' curb inlet.	
DA10	Abshire Ln	2.37	0.62	2.99	82.64	0.013	0.02	0.01	0.15	12.09	0.42	0.60	4.97	10.00	2.01	2.85	1.00	2.99	0.00	DA6	Ex. 10' curb inlet.	
Proposed Line A																						
DA8	Abshire Ln	4.14	0.00	4.14	82.64	0.013	0.02	0.01	0.17	13.66	0.42	0.62	6.68	10.00	1.50	2.52	1.00	4.14	0.00	DA1	Ex. 10' curb inlet connection to Line A.	
DA9	Abshire Ln	3.61	1.28	4.89	82.64	0.013	0.02	0.01	0.18	14.54	0.42	0.63	7.77	10.00	1.29	2.37	1.00	4.89	0.00	DA5	Ex. 10' curb inlet.	
DA10	Abshire Ln	2.95	0.62	3.57	82.64	0.013	0.02	0.01	0.16	12.92	0.42	0.61	5.84	10.00	1.71	2.67	1.00	3.57	0.00	DA6	Ex. 10' curb inlet.	
DA11	Abshire Ln	4.76	0.00	4.76	82.64	0.013	0.02	0.01	0.17	14.39	0.42	0.63	7.58	10.00	1.32	2.39	1.00	4.76	0.00	DA9	Proposed 10' Curb Inlet.	
DA12	Abshire Ln	4.06	0.00	4.06	82.64	0.013	0.02	0.01	0.16	13.56	0.42	0.62	6.57	10.00	1.52	2.54	1.00	4.06	0.00	DA10	Proposed 10' Curb Inlet.	
Proposed Line C																						
DA30	Freeport Dr	2.38	2.88	5.26	82.64	0.013	0.02	0.01	0.18	14.94	0.42	0.63	8.29	10.00	1.21	2.30	1.00	5.26	0.00		Proposed 10' Curb Inlet.	
DA27	Freeport Dr	2.74	4.35	7.09	82.64	0.013	0.02	0.01	0.20	16.71	0.42	0.66	10.82	10.00	0.92	2.06	1.00	7.09	0.00		Proposed 10' Curb Inlet.	
DA23	Abshire Ln	1.78	0.00	1.78	82.64	0.013	0.02	0.01	0.12	9.95	0.42	0.58	3.08	10.00	3.24	3.46	1.00	1.78	0.00	DA27	Proposed 10' Curb Inlet.	
DA24	Abshire Ln	0.92	0.00	0.92	82.64	0.013	0.02	0.01	0.09	7.77	0.42	0.55	1.66	10.00	6.01	4.43	1.00	0.92	0.00	DA23	Proposed 10' Curb Inlet.	
DA26	Freeport Dr Alley	7.65	0.00	7.65	82.64	0.013	0.02	0.01	0.21	17.19	0.42	0.66	11.58	10.00	0.86	2.00	1.00	7.65	0.00	DA24	Proposed 10' Curb Inlet.	
DA21	Capriola Dr Alley	8.31	0.00	8.31	82.64	0.013	0.02	0.01	0.21	17.73	0.42	0.67	12.25	10.00	0.80	1.99	1.00	8.31	0.00	DA18	Proposed Four Grade Inlet.	
DA19	Capriola Dr	4.20	7.83	12.03	82.64	0.013	0.02	0.01	0.25	20.37	0.42	0.70	27.21	5.33	0.31	1.69	0.60	7.22	4.81	DA12	Proposed 10' Curb Inlet.	
DA19	Capriola Dr	4.02	4.38	8.40	82.64	0.013	0.02	0.01	0.22	17.87	0.42	0.67	12.57	10.00	0.80	1.93	1.00	8.40	0.00	DA10	Proposed 10' Curb Inlet.	
Proposed Line D																						
DA31	Freeport Dr	2.68	1.80	4.48	82.64	0.013	0.02	0.01	0.17	14.07	0.42	0.62	7.18	10.00	1.39	2.45	1.00	4.48	0.00	DA30	Proposed 10' Curb Inlet.	
DA28	Freeport Dr	2.90	1.80	4.70	82.64	0.013	0.02	0.01	0.17	14.32	0.42	0.63	7.49	10.00	1.33	2.40	1.00	4.70	0.00	DA27	Proposed 10' Curb Inlet.	
DA32	Freeport Dr	2.30	0.00	2.30	82.64	0.013	0.02	0.01	0.13	10.96	0.42	0.59	3.91	10.00	2.56	3.14	1.00	2.30	0.00	DA31	Proposed 10' Curb Inlet.	
DA29	Freeport Dr	2.30	0.00	2.30	82.64	0.013	0.02	0.01	0.13	10.96	0.42	0.59	3.91	10.00	2.56	3.14	1.00	2.30	0.00	DA28	Proposed 10' Curb Inlet.	
Proposed Line E																						
DA18	Capriola Ln	3.86	0.00	3.86	82.64	0.013	0.02	0.01	0.16	13.30	0.42	0.62	6.27	10.00	1.59	2.59	1.00	3.86	0.00	DA19	Proposed 10' Curb Inlet.	
DA20	Capriola Ln	3.13	0.00	3.13	82.64	0.013	0.02	0.01	0.15	12.30	0.42	0.60	5.18	10.00	1.93	2.80	1.00	3.13	0.00	DA19	Proposed 10' Curb Inlet.	
Proposed Line F																						
DA25	Capriola Ln	3.48	0.00	3.48	82.64	0.013	0.02	0.01	0.15	12.80	0.42	0.61	5.71	10.00	1.75	2.69	1.00	3.48	0.00	DA18	Proposed 10' Curb Inlet.	
DA22	Capriola Ln	3.70	0.00	3.70	82.64	0.013	0.02	0.01	0.16	13.09	0.42	0.61	6.04	10.00	1.66	2.63	1.00	3.70	0.00	DA18	Proposed 10' Curb Inlet.	

CURB INLETS AT SAG COMPUTATIONS											REMARKS
INLET		Q _{in}	CO	Q _a	L	W	d	h	Weir Flow	Orifice Flow	
ID	LOCATION	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	
Proposed Line C											
DA17	Abshire Ln Sta. 9+49	3.03	0.00	3.03	10.00	0.417	0.27	0.50	3.17	3.40	Proposed 10' curb inlet.
DA18	Abshire Ln Sta. 8+94	1.13	12.87	14.00	10.00	0.417	0.64	0.50	11.56	15.03	Proposed 10' curb inlet.

GRATE INLETS AT SAG COMPUTATIONS											REMARKS
INLET		Q ₁₀₀	C ₀	Q ₀	Bypass	d	P _A	P _E	Weir Flow	Orifice Flow	
ID	LOCATION	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(cfs)	(cfs)	
Proposed Line A											
DA13	Abshire In Alley Sta. 10+00	0.95	1.33	2.28	0	0.14	13.32	6.66	1.04	13.80	Four Grate Inlet in Alley.
Proposed Line B											
DA7-A	Abshire In Alley Sta. 1+80	8.94	0.00	6.31	2.63	0.48	13.32	6.66	6.69	25.66	Four Grate Inlet at Grade.
DA7-A	Abshire In Alley Sta. 0+56	1.28	2.63	1.28	0.00	0.35	13.32	6.66	4.05	21.71	Four Grate Inlet.
DA7-B	Abshire In Alley Sta. 0+25	1.28	0.00	1.28	0.00	0.12	13.32	6.66	0.78	12.54	Four Grate Inlet.



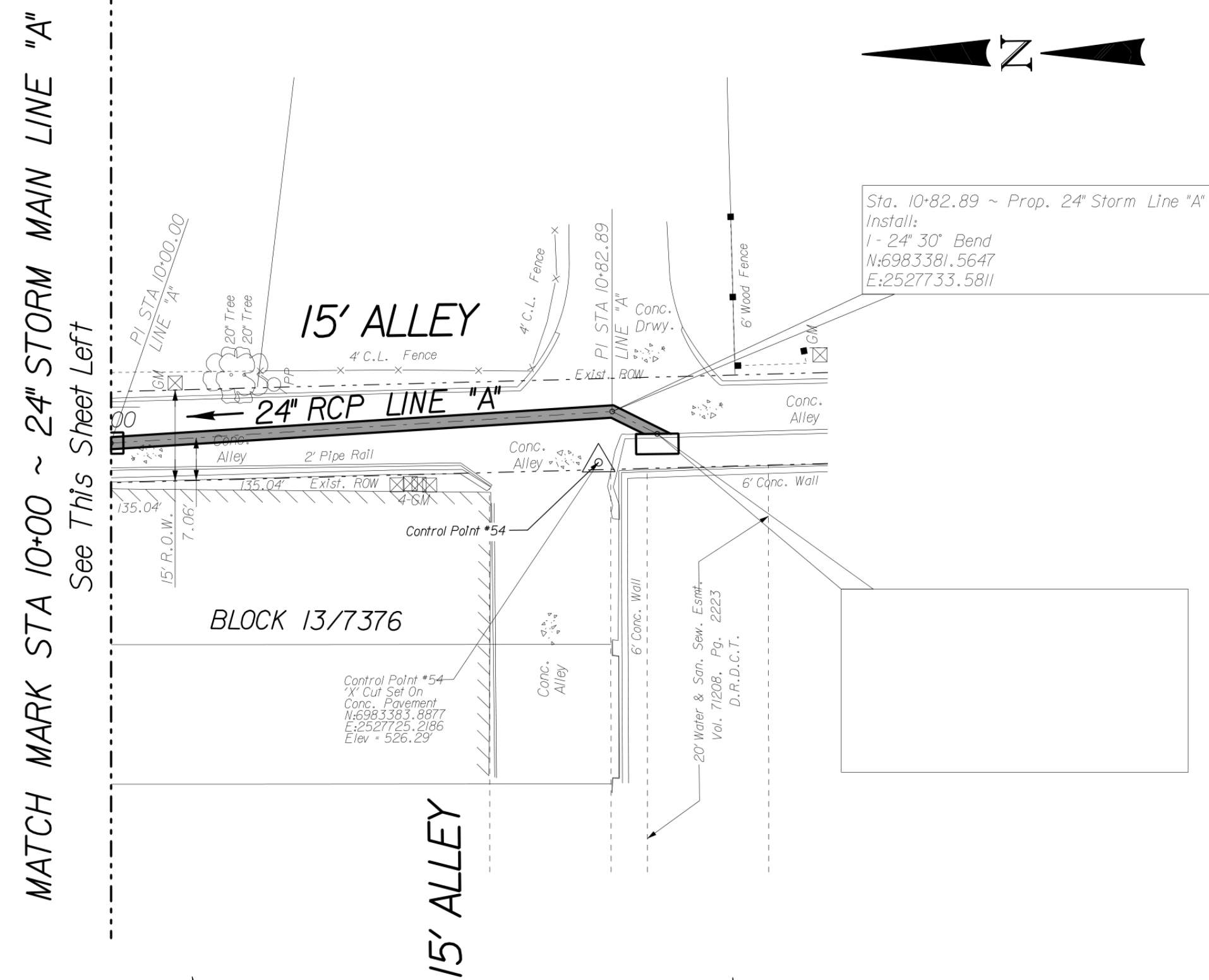
CAUTION ~ GAS !
Underground Gas Main In Area
Contact ATMOS Energy Corp. Two Working
Days Prior To Construction.
Tele: 1-800-344-8377/1-800-545-6005

CAUTION ~ TELEPHONE !
Underground Telephone Cables In Area
Contact S.B.C. Two Working
Days Prior To Construction.
Tele: 1-800-344-8377

CAUTION ~ POWER !
Underground Electrical Cables In Area
Contact TXU Two Working
Days Prior To Construction.
Tele: 1-800-344-8377

CAUTION
Advanced Metering Infrastructure
(AMI) Meters In Area
AMI Components Shall be Disconnected, Reconnected,
Removed, or Installed by DMU Personnel ONLY.
Contact DMU Meter Reading Operations
(MRO) 5 working days in advance.

**CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION**

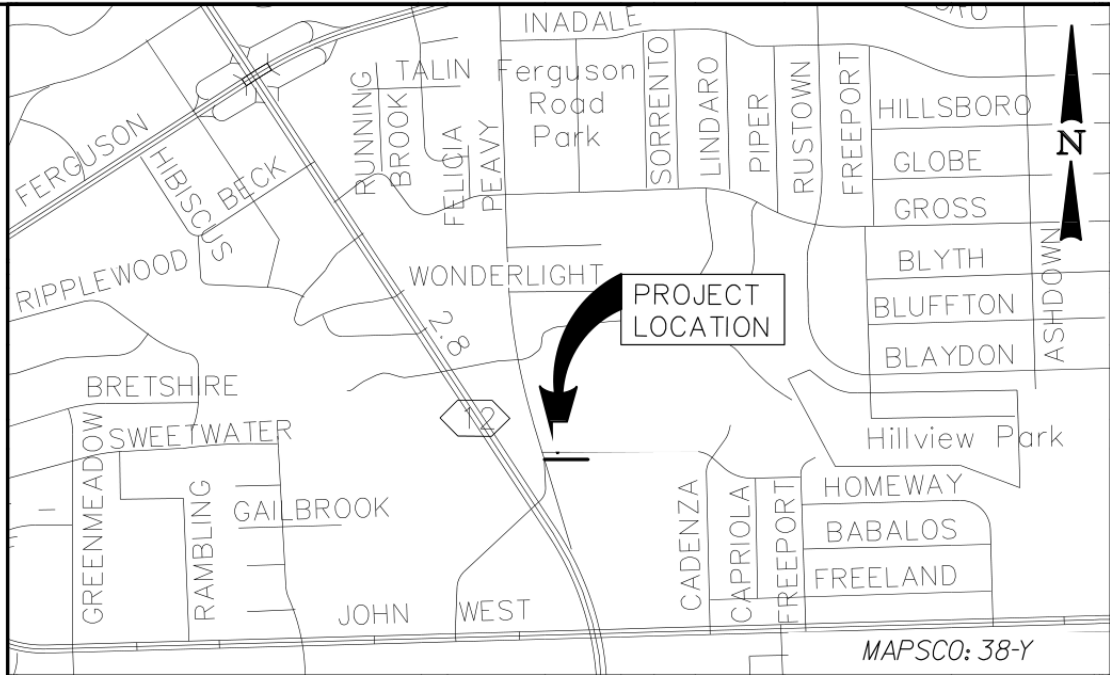


CAUTION
*Advanced Metering Infrastructure
(AMI) Meters In Area*

AMI Components Shall be Disconnected, Reconnected,
Removed, or Installed by DWU Personnel ONLY.
Contact DWU Meter Reading Operations
(MRO) 5 working days in advance.

INSTALL 92 L.F. 24" RCP CLASS III
STORM DRAIN LINE "A"
(REFER TO DETAIL 25/D-2006 FOR TYPE OF
EMBEDMENT & OTHER INSTALLATION NOTES)



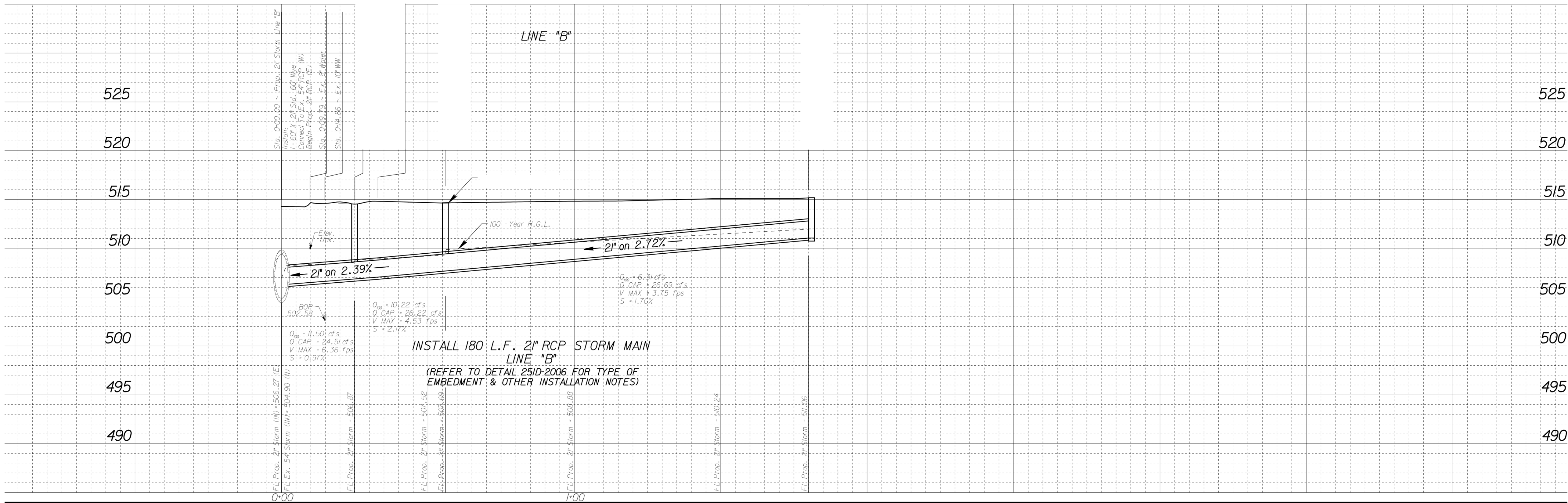


CAUTION ~ GAS !
Underground Gas Main In Area
Contact ATMOS Energy Corp. Two Working
Days Prior To Construction.
Tele: 1-800-344-8377/1-800-545-6005

CAUTION ~ TELEPHONE !
Underground Telephone Cables In Area
Contact S.B.C. Two Working
Days Prior To Construction.
Tele: 1-800-344-8377

CAUTION ~ POWER !
Underground Electrical Cables In Area
Contact TXU Two Working
Days Prior To Construction.
Tele: 1-800-344-8377

CAUTION
Advanced Metering Infrastructure
(AMI) Meters In Area
AMI Components Shall be Disconnected, Reconnected,
Removed, or Installed by DWU Personnel ONLY.
Contact DWU Meter Reading Operations
(MRO) 5 working days in advance.

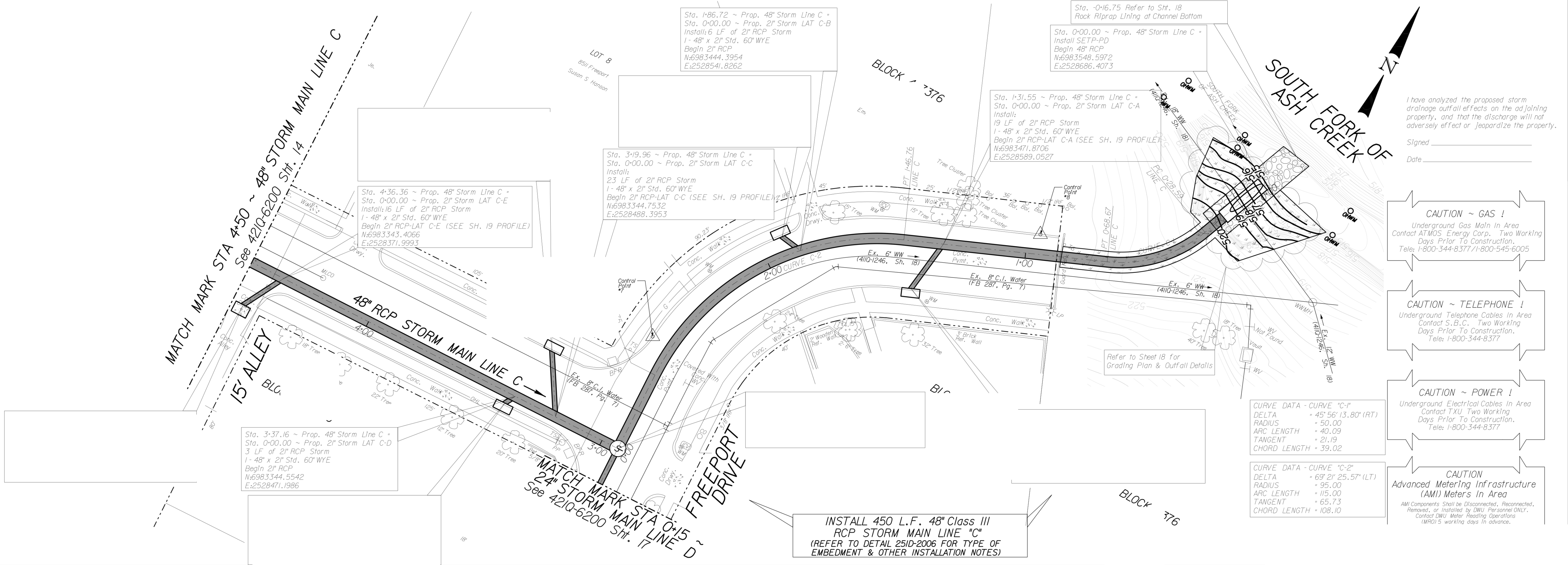


**CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION**

Sample 01 | Sheet 12 of 25

Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party sheets included for context.



I have analyzed the proposed storm drainage outfall effects on the adjoining property, and that the discharge will not adversely effect or jeopardize the property.

Signed _____
Date _____

CAUTION ~ GAS !
Underground Gas Main in Area
Contact ATMOS Energy Corp. Two Working Days Prior To Construction.
Tele: 1-800-344-8377/1-800-545-6005

CAUTION ~ TELEPHONE !
Underground Telephone Cables In Area
Contact S.B.C. Two Working Days Prior To Construction.
Tele: 1-800-344-8377

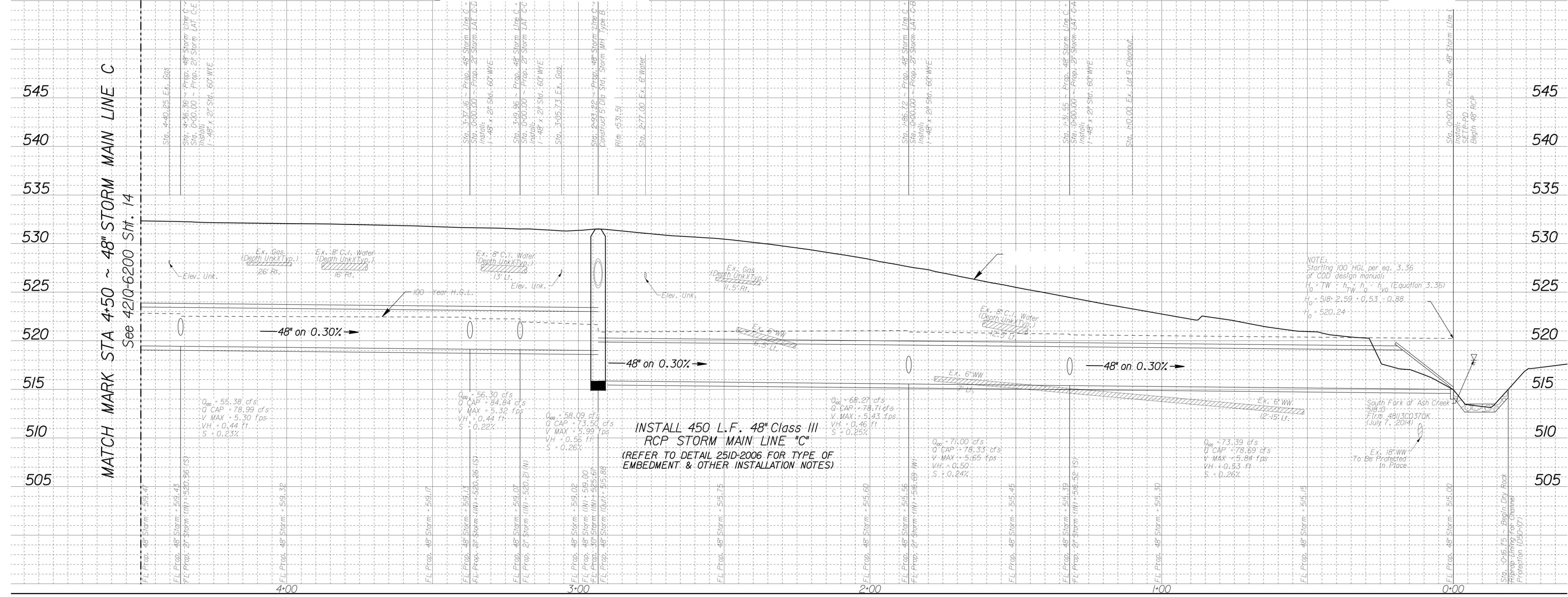
CAUTION ~ POWER !
Underground Electrical Cables In Area
Contact TXU Two Working Days Prior To Construction.
Tele: 1-800-344-8377

CAUTION
Advanced Metering Infrastructure (AMI) Meters In Area
AMI Components Shall be Disconnected, Reconnected, Removed, or Installed by DMU Personnel ONLY.
Contact DMU Meter Reading Operations (MRO) 5 working days in advance.

CURVE DATA - CURVE "C-1"
DELTA = 45° 56' 13.80" (RT)
RADIUS = 50.00
ARC LENGTH = 40.09
TANGENT = 21.19
CHORD LENGTH = 39.02

CURVE DATA - CURVE "C-2"
DELTA = 69° 21' 25.57" (LT)
RADIUS = 95.00
ARC LENGTH = 19.00
TANGENT = 65.73
CHORD LENGTH = 108.10

INSTALL 450 L.F. 48" Class III RCP STORM MAIN LINE "C"
(REFER TO DETAIL 251D-2006 FOR TYPE OF EMBEDMENT & OTHER INSTALLATION NOTES)

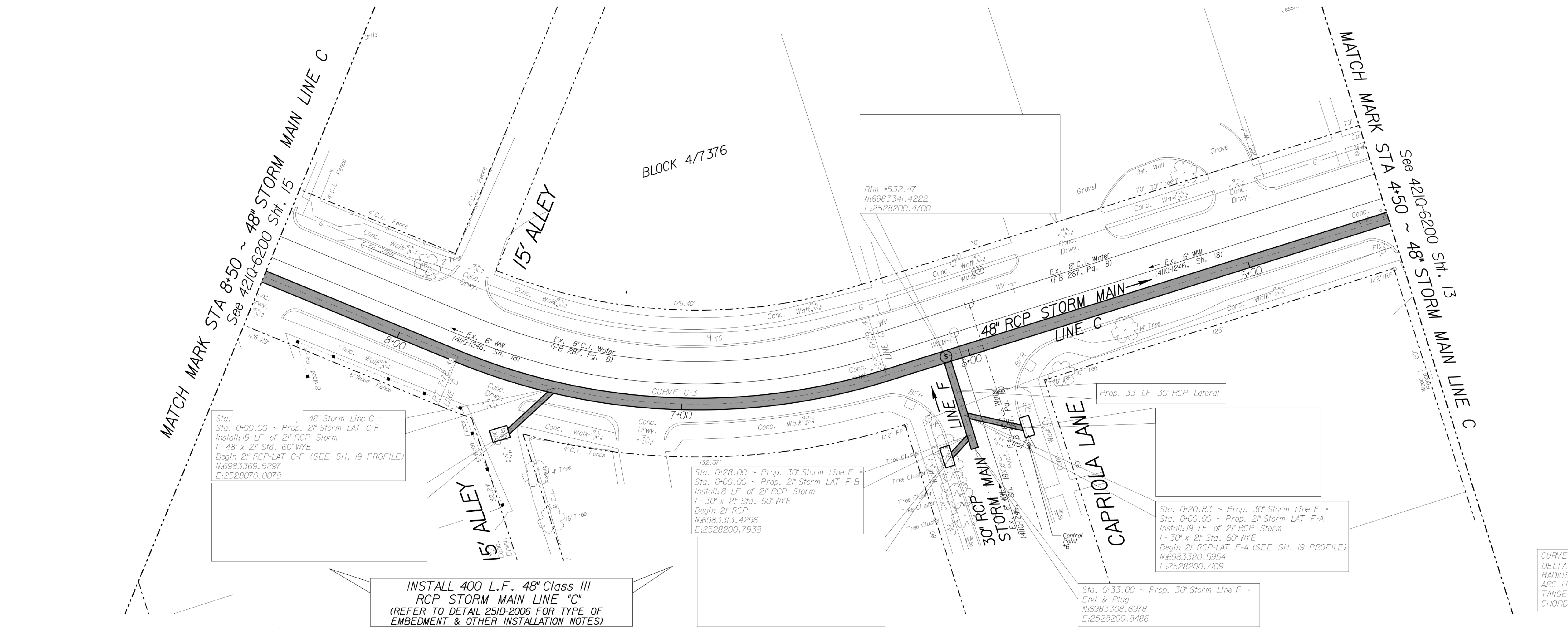


CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

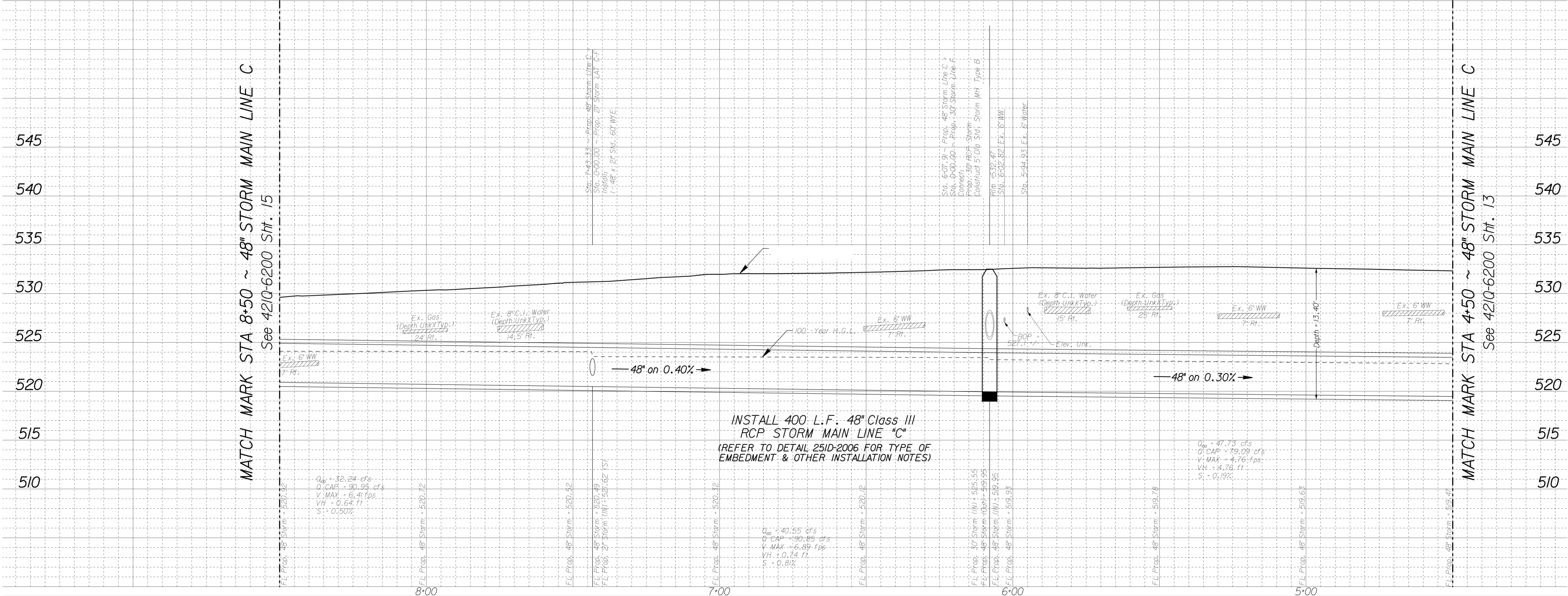
Sample 01 | Sheet 13 of 25

Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party sheets included for context.

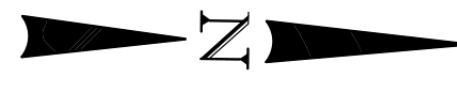
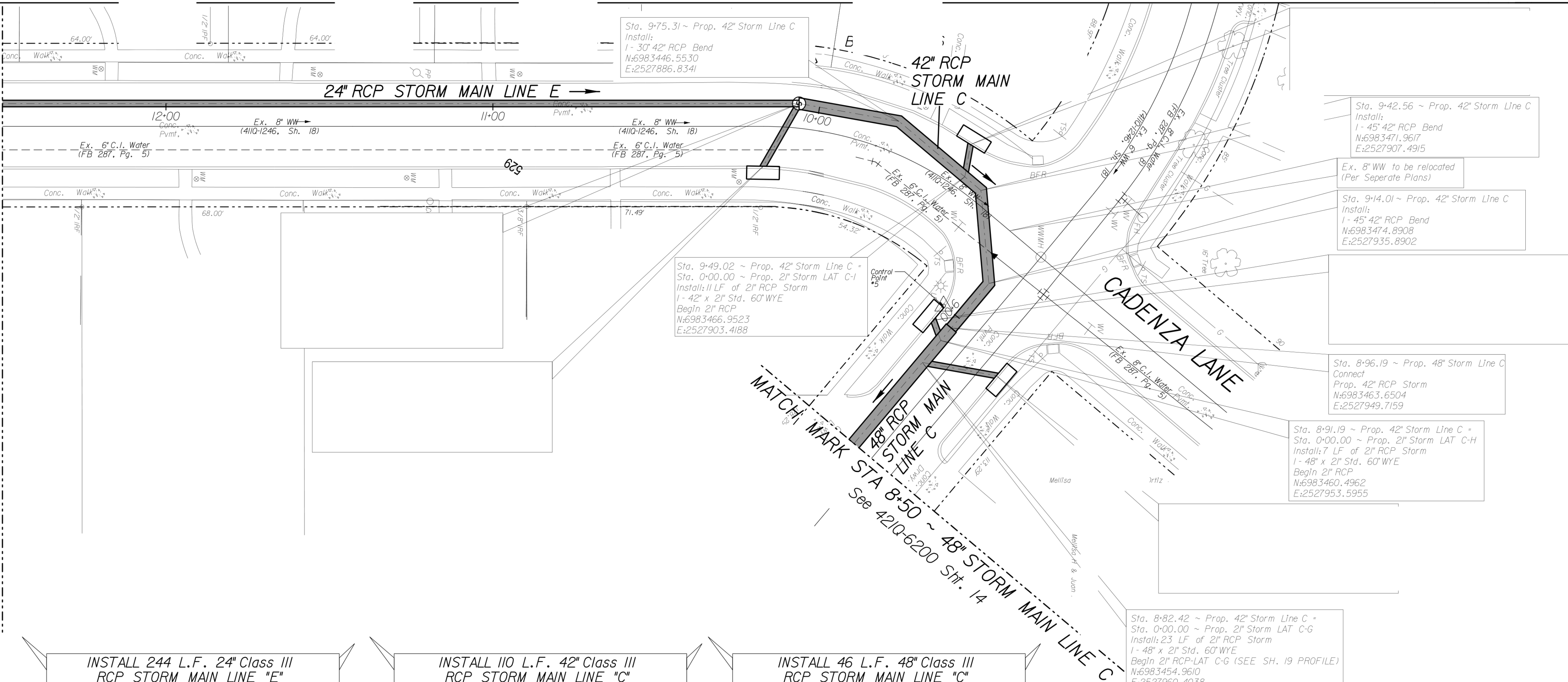


- CAUTION ~ GAS !**
Underground Gas Main In Area
Contact ATMOS Energy Corp. Two Working Days Prior To Construction.
Tele: 1-800-344-8377/1-800-545-6005
- CAUTION ~ TELEPHONE !**
Underground Telephone Cables In Area
Contact S.B.C. Two Working Days Prior To Construction.
Tele: 1-800-344-8377
- CAUTION ~ POWER !**
Underground Electrical Cables In Area
Contact TXU Two Working Days Prior To Construction.
Tele: 1-800-344-8377
- CAUTION**
Advanced Metering Infrastructure (AMI) Meters In Area
AMI Components Shall be Disconnected, Reconnected, Removed, or Installed by DMU Personnel ONLY.
Contact DMU Meter Reading Operations (MRO) 5 working days in advance.



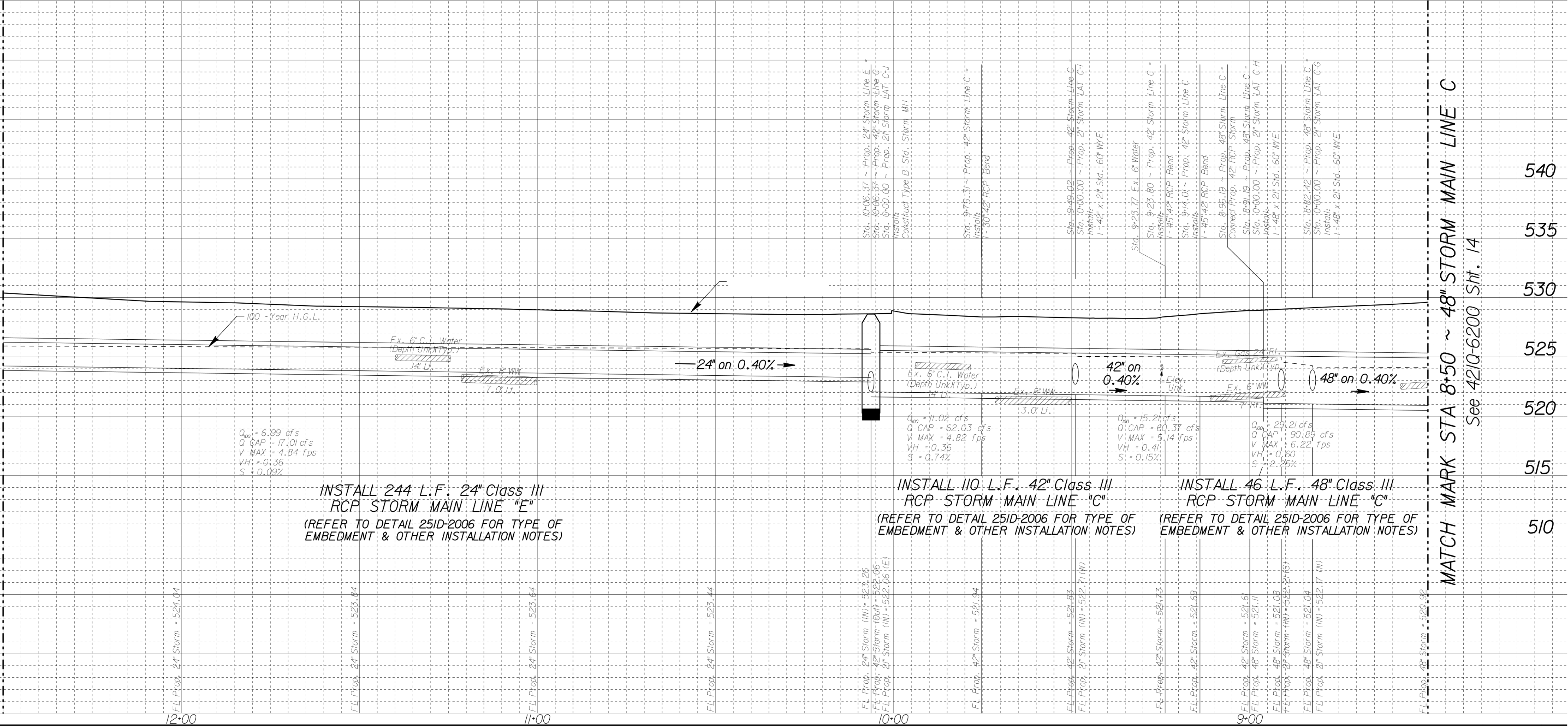
CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

MATCH MARK STA 12+50 ~ 24" STORM MAIN LINE E
See 421Q-6200 Sht. 16



- CAUTION ~ GAS !**
Underground Gas Main In Area
Contact ATMOS Energy Corp. Two Working Days Prior To Construction.
Tele: 1-800-344-8377/1-800-545-6005
- CAUTION ~ TELEPHONE !**
Underground Telephone Cables In Area
Contact S.B.C. Two Working Days Prior To Construction.
Tele: 1-800-344-8377
- CAUTION ~ POWER !**
Underground Electrical Cables In Area
Contact TXU Two Working Days Prior To Construction.
Tele: 1-800-344-8377
- CAUTION**
Advanced Metering Infrastructure (AMI) Meters In Area
AMI Components Shall be Disconnected, Reconnected, Removed, or Installed by DWU Personnel ONLY.
Contact DWU Meter Reading Operations (MRO) 5 working days in advance.

MATCH MARK STA 12+50 ~ 24" STORM MAIN LINE E
See 421Q-6200 Sht. 16



MATCH MARK STA 8+50 ~ 48" STORM MAIN LINE C
See 421Q-6200 Sht. 14

CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

BLOCK 2/7376

BLOCK 2/7376



CADENZA LANE

24" RCP STORM MAIN LINE E

MATCH MARK STA 12+50 ~ 24" STORM MAIN LINE E
See 4210-6200 Sht. 15

CAUTION ~ GAS !
Underground Gas Main In Area
Contact ATMOS Energy Corp. Two Working
Days Prior To Construction.
Tele: 1-800-344-8377/1-800-545-6005

CAUTION ~ TELEPHONE !
Underground Telephone Cables In Area
Contact S.B.C. Two Working
Days Prior To Construction.
Tele: 1-800-344-8377

CAUTION ~ POWER !
Underground Electrical Cables In Area
Contact TXU Two Working
Days Prior To Construction.
Tele: 1-800-344-8377

CAUTION
Advanced Metering Infrastructure
(AMI) Meters In Area
AMI Components Shall be Disconnected, Reconnected,
Removed, or Installed by DMU Personnel ONLY.
Contact DMU Meter Reading Operations
(MRO) 5 working days in advance.

BLOCK 5/7376

INSTALL 299 L.F. 24" Class III
RCP STORM MAIN LINE "E"
(REFER TO DETAIL 25ID-2006 FOR TYPE OF
EMBEDMENT & OTHER INSTALLATION NOTES)

540

535

530

525

520

515

510

540

535

530

525

520

515

510

Sta. 5+00.00 ~ Prop. 24" Storm Main Line E
Sta. 5+00.00 ~ Prop. 24" Storm Main Line E
Sta. 5+00.00 ~ Prop. 24" Storm Main Line E
Construct Type A, 3rd Storm Main

EL Prop. 24" Storm = 529.00
EL Prop. 24" Storm = 529.13
EL Prop. 24" Storm = 529.13
EL Prop. 24" Storm = 529.13

15+00

EL Prop. 24" Storm = 526.42

EL Prop. 24" Storm = 525.72

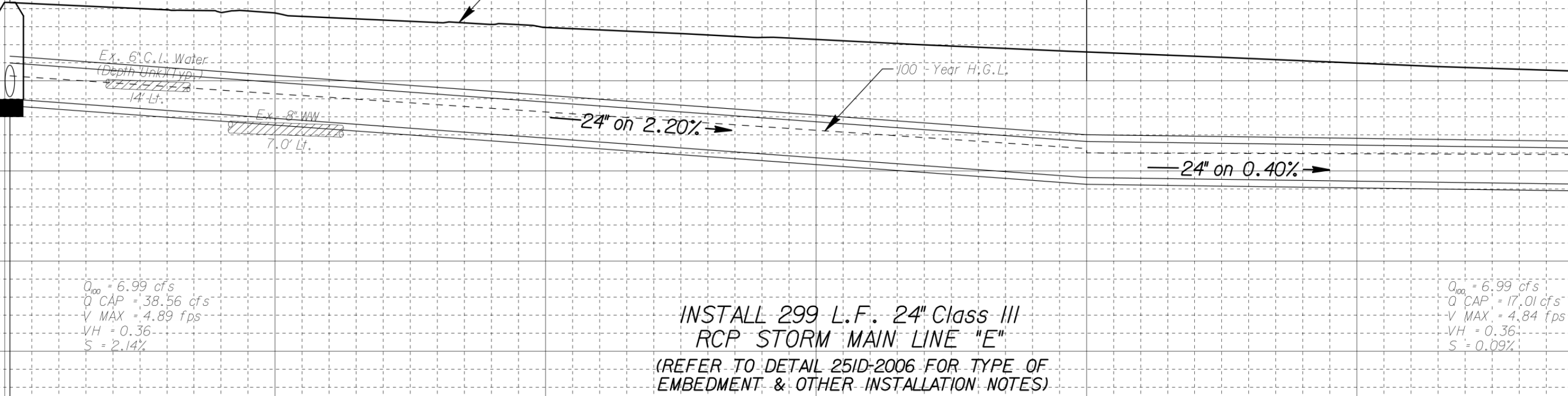
14+00

EL Prop. 24" Storm = 524.64

EL Prop. 24" Storm = 524.44

13+00

MATCH MARK STA 12+50 ~ 24" STORM MAIN LINE E
See 4210-6200 Sht. 15

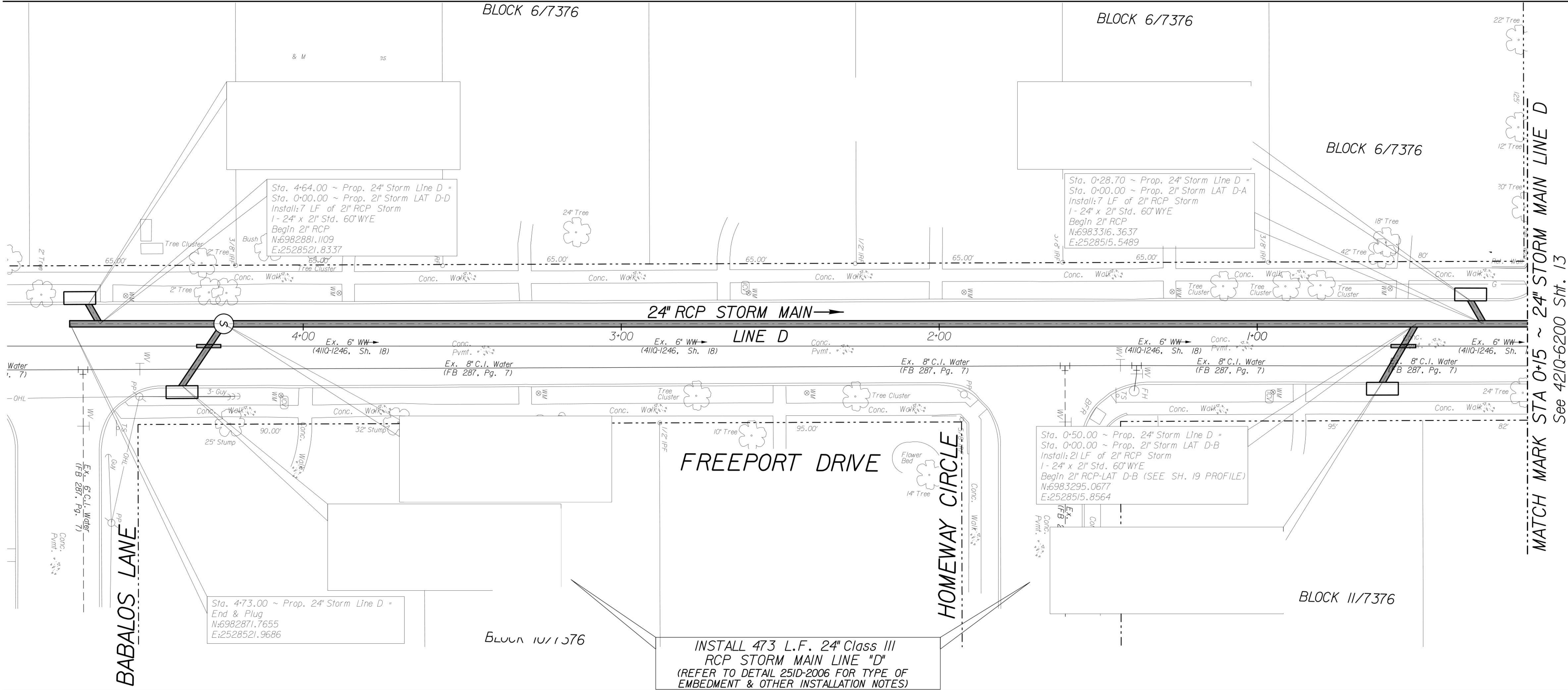


CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

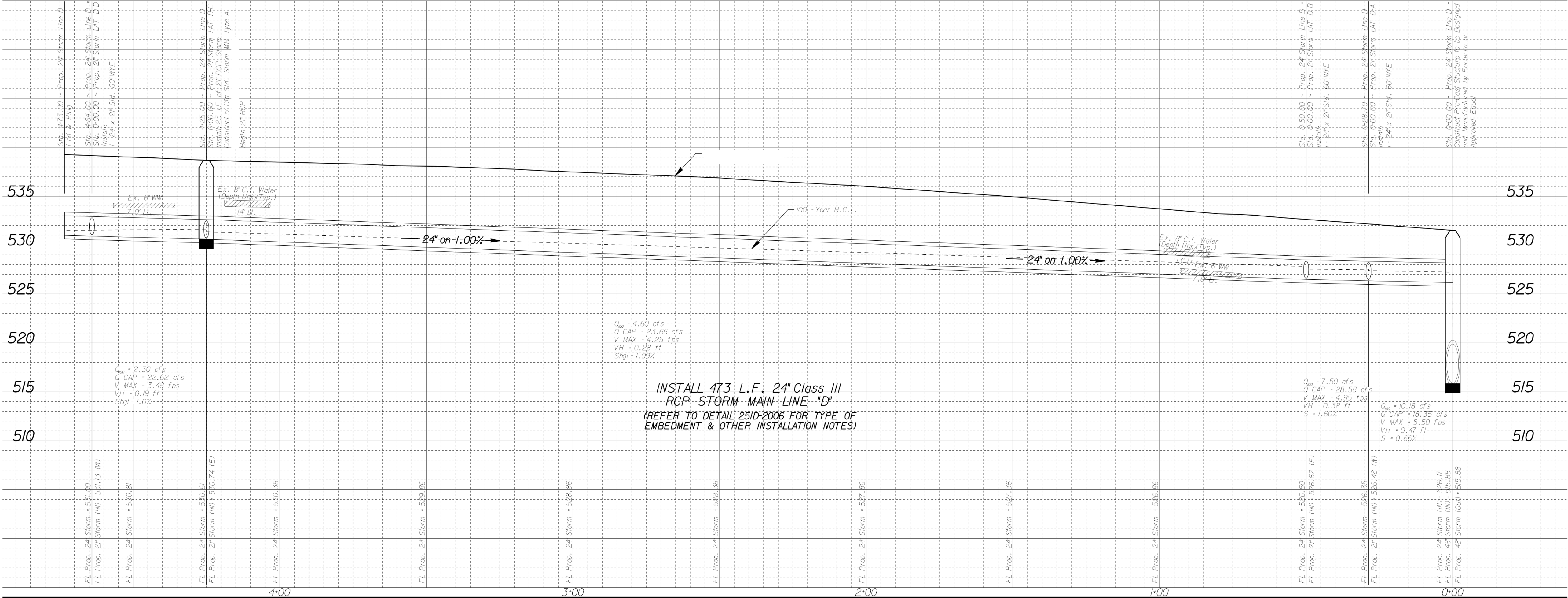
Sample 01 | Sheet 16 of 25

Portfolio reference only.
Not for construction.

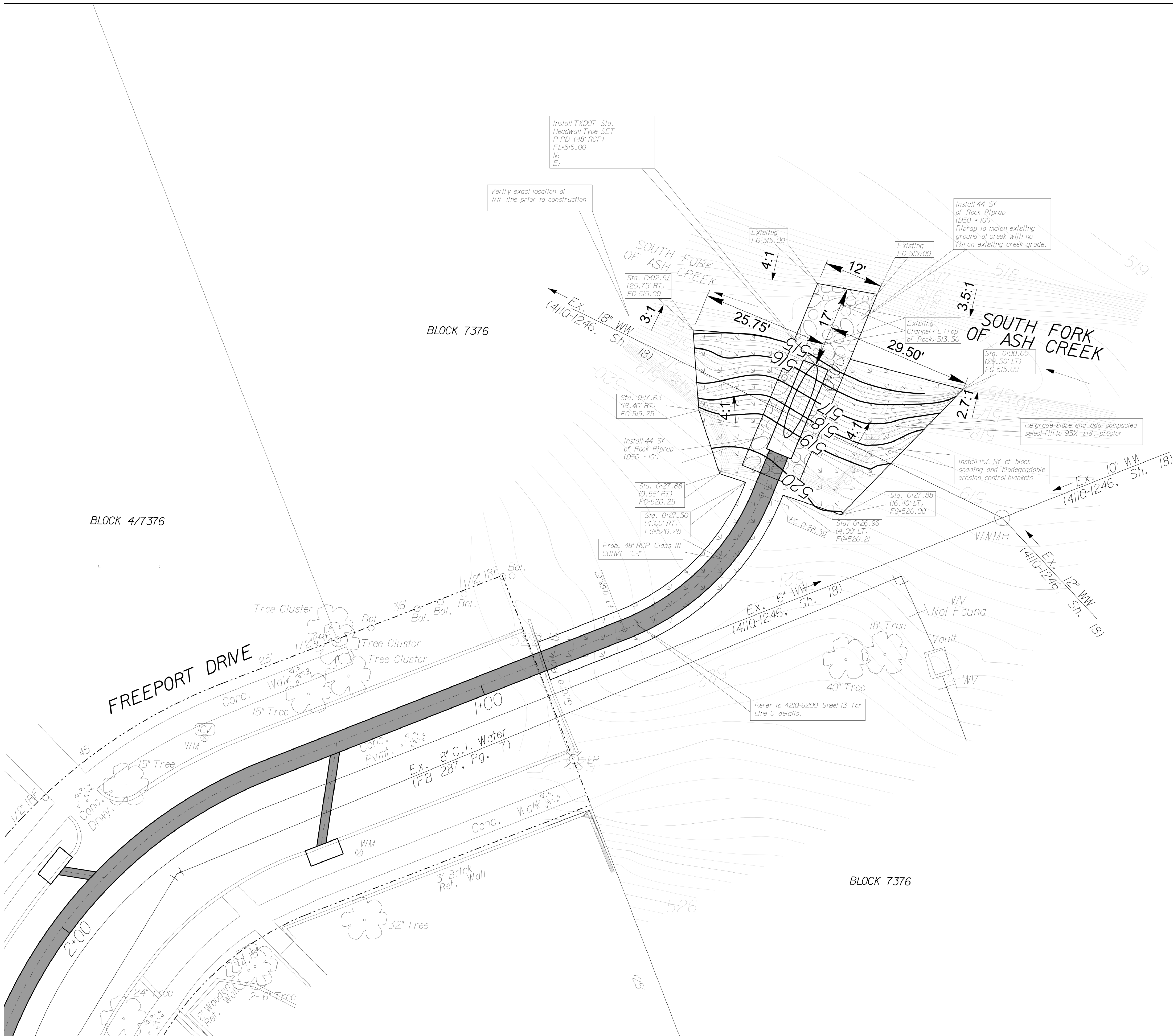
Production support under the client engineering team. Supporting third-party
sheets included for context.



- CAUTION ~ GAS !**
Underground Gas Main In Area
Contact AT&S Energy Corp. Two Working Days Prior To Construction.
Tele: 1-800-344-8377/1-800-545-6005
- CAUTION ~ TELEPHONE !**
Underground Telephone Cables In Area
Contact S.B.C. Two Working Days Prior To Construction.
Tele: 1-800-344-8377
- CAUTION ~ POWER !**
Underground Electrical Cables In Area
Contact TXU Two Working Days Prior To Construction.
Tele: 1-800-344-8377
- CAUTION**
Advanced Metering Infrastructure (AMI) Meters In Area
AMI Components Shall be Disconnected, Reconnected, Removed, or Installed by DMU Personnel ONLY.
Contact DMU Meter Reading Operations (MRO) 5 working days in advance.



**CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION**



LEGEND

- Exst. Minor Contour Line
- Exst. Major Countour Line
- Prop. Minor Contour Line
- Prop. Major Contour Line
- Block Sodding & Erosion Control Blankets
- Rock Riprap

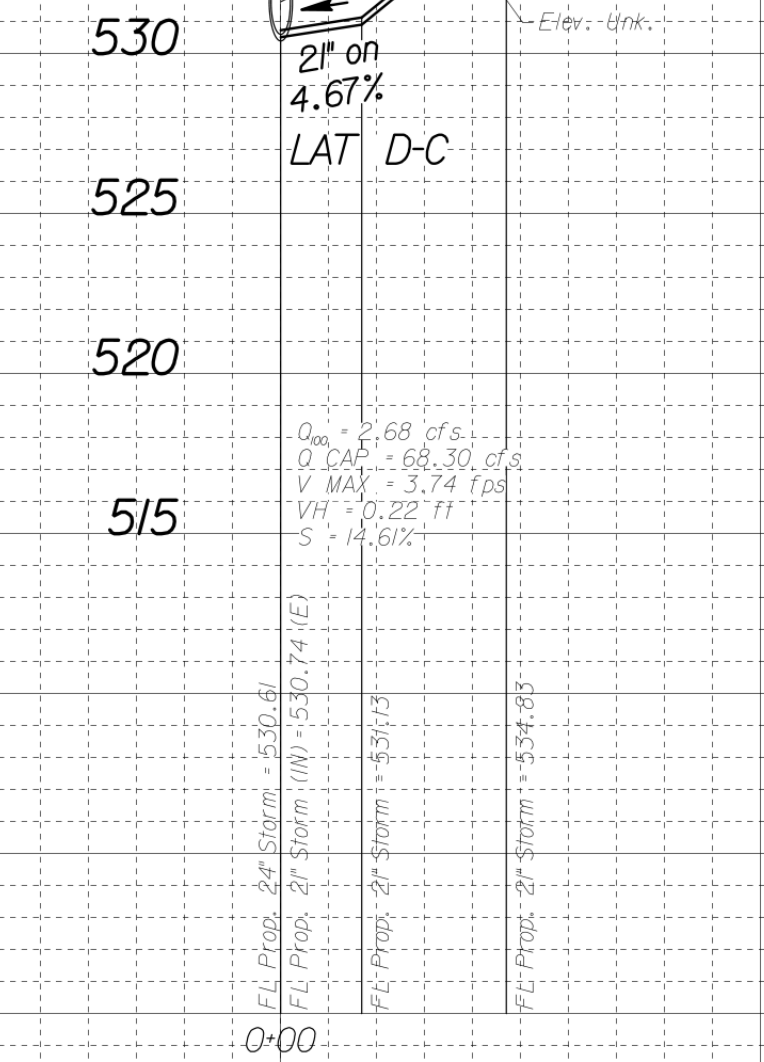
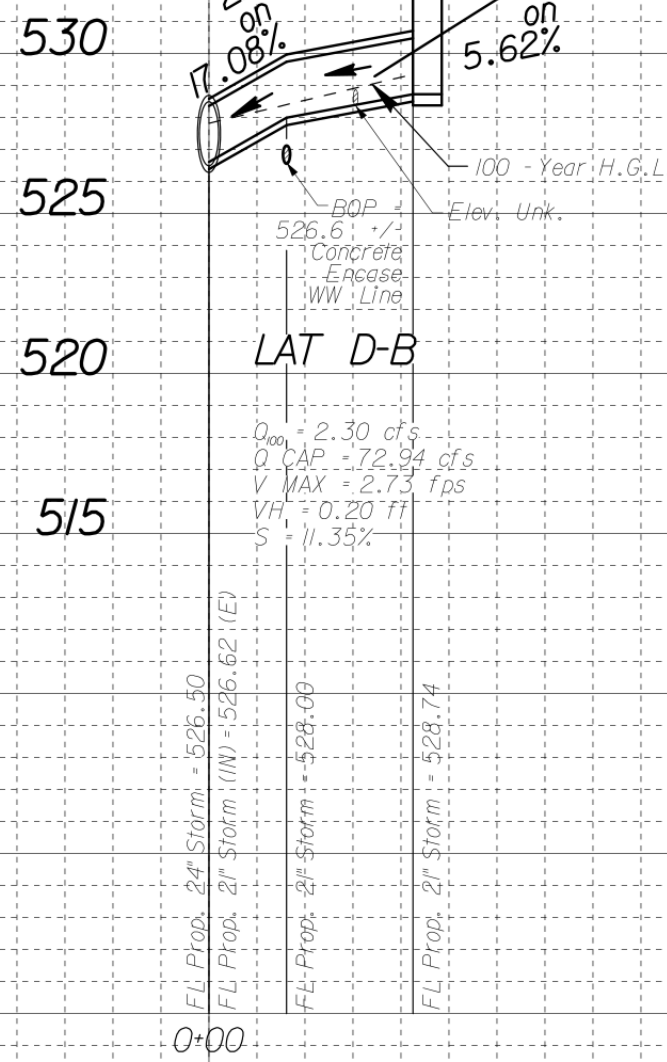
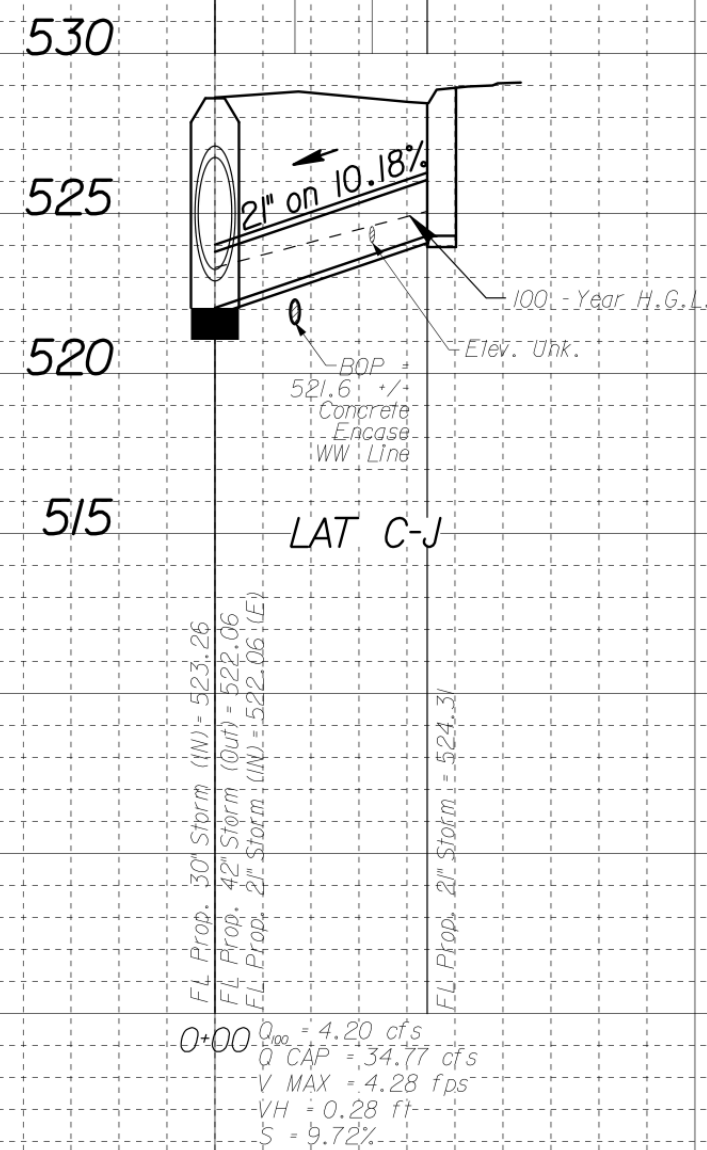
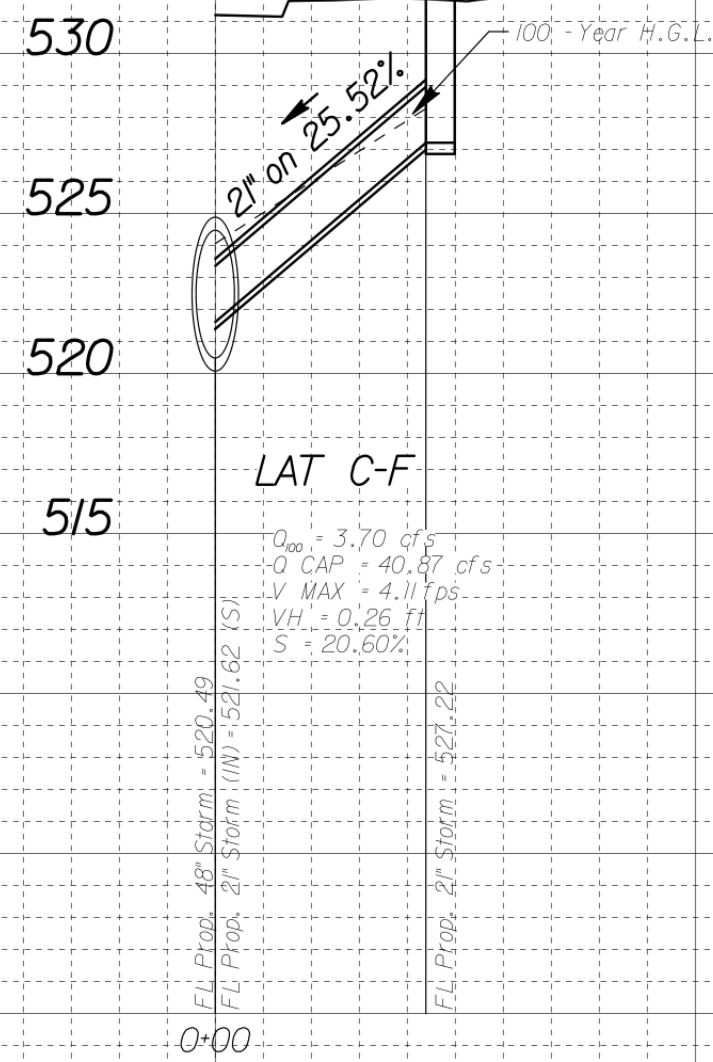
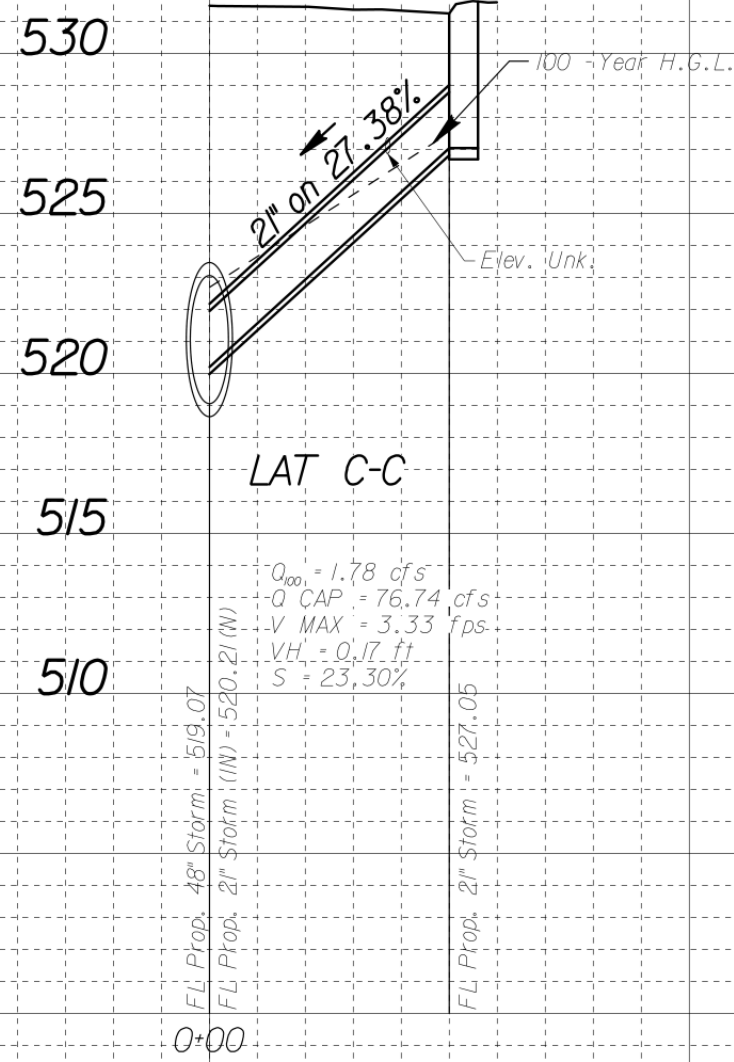
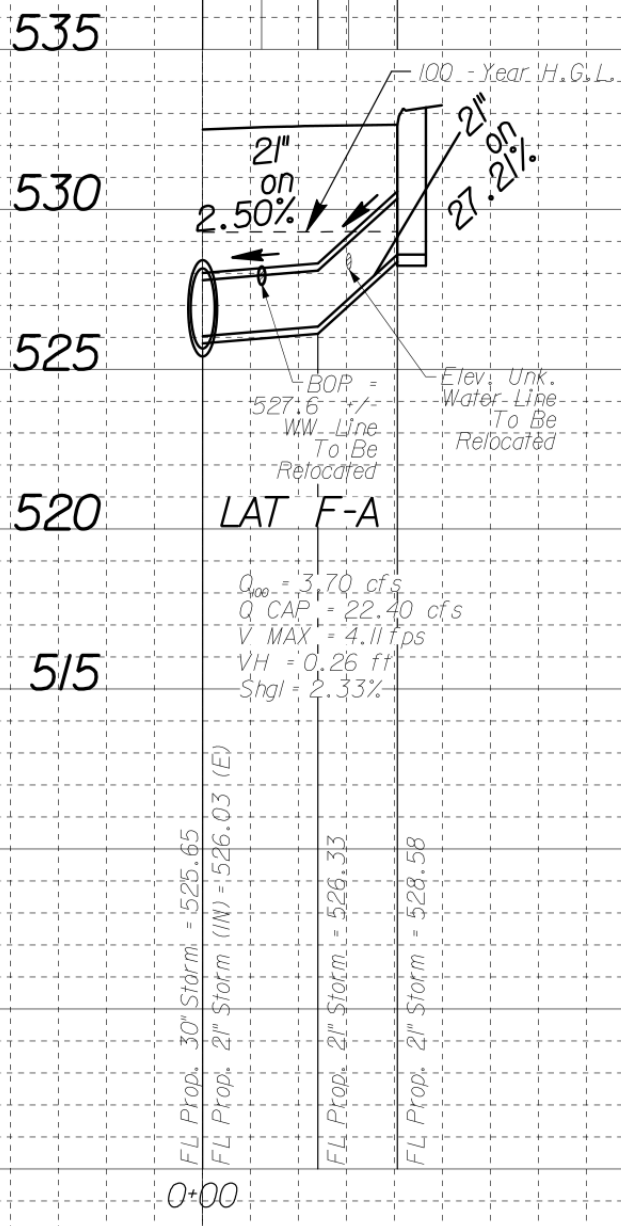
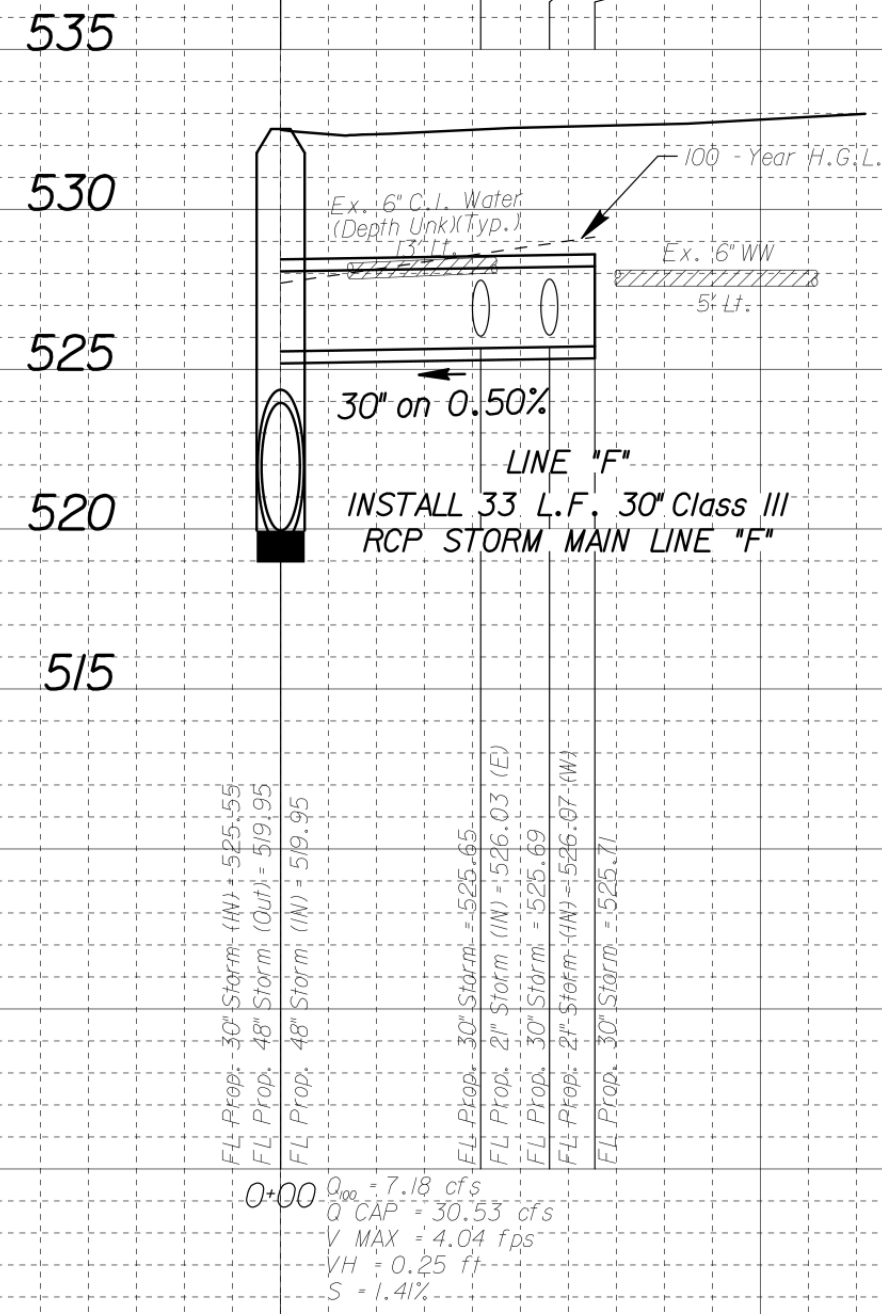
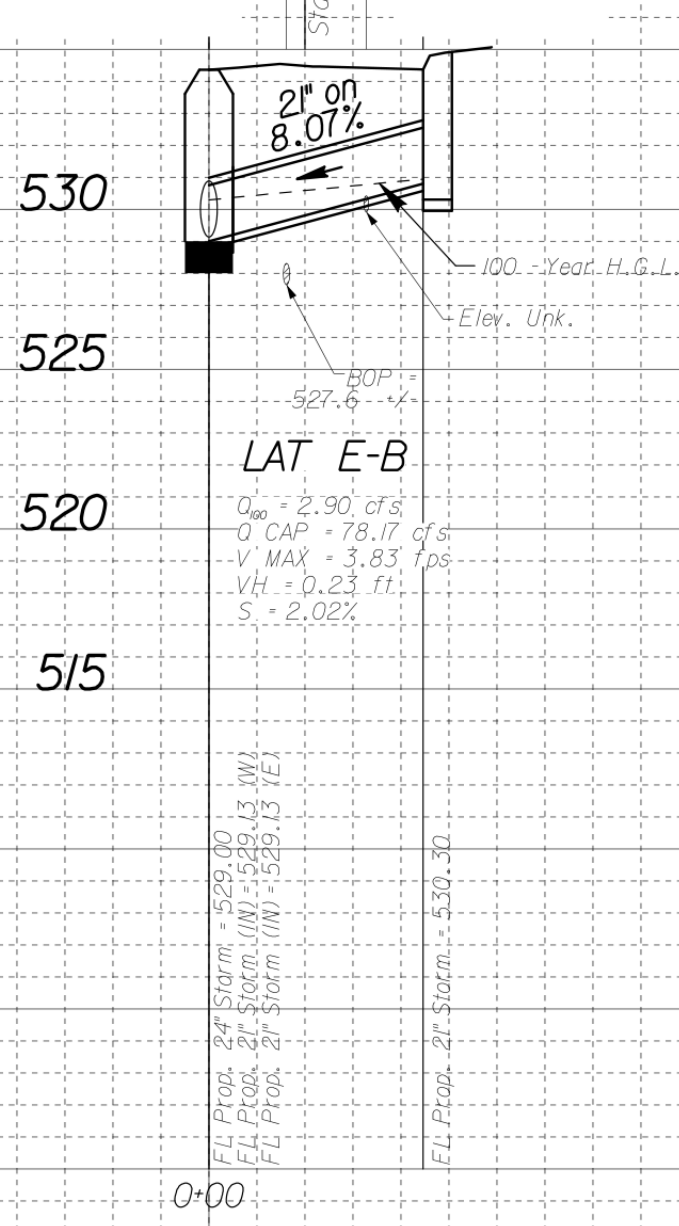
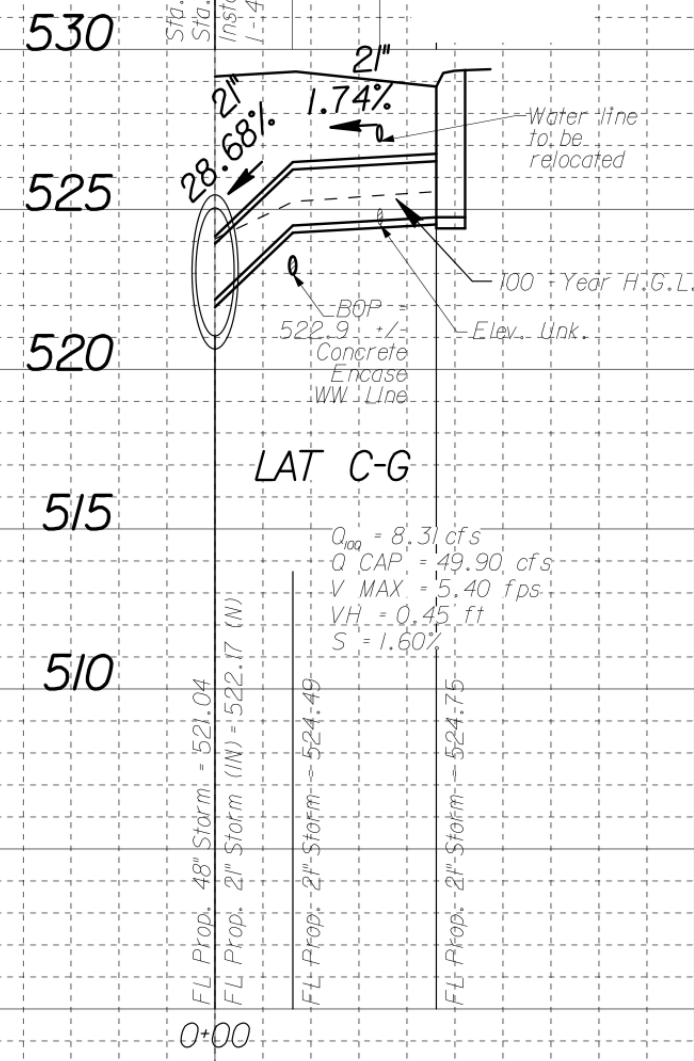
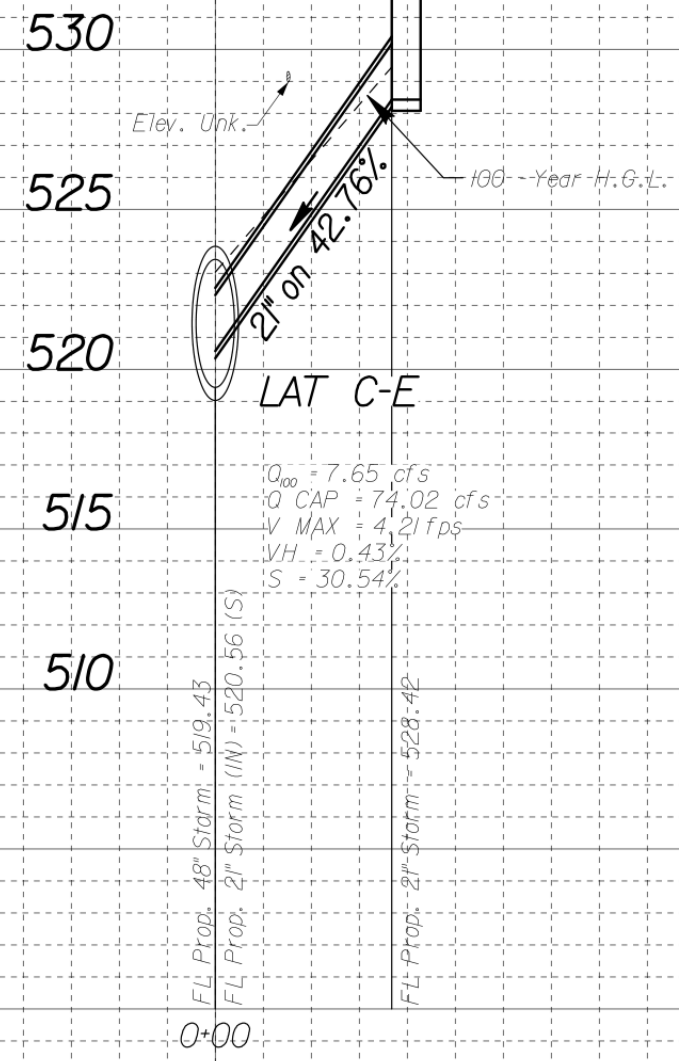
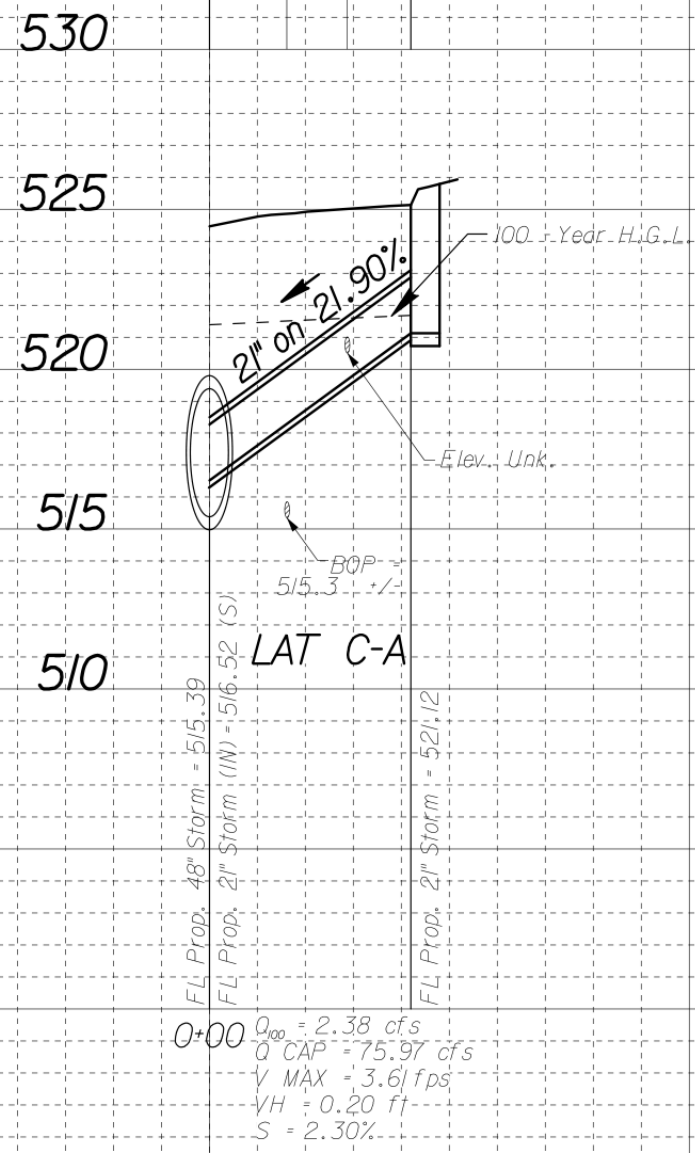
CURVE DATA - CURVE "C-F"
DELTA = 45° 56' 13.80" (RT)
RADIUS = 50.00
ARC LENGTH = 40.09
P.I. Sta. 0+49.78
TANGENT = 21.19
CHORD LENGTH = 39.02

CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

Sample 01 | Sheet 18 of 25

Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party sheets included for context.

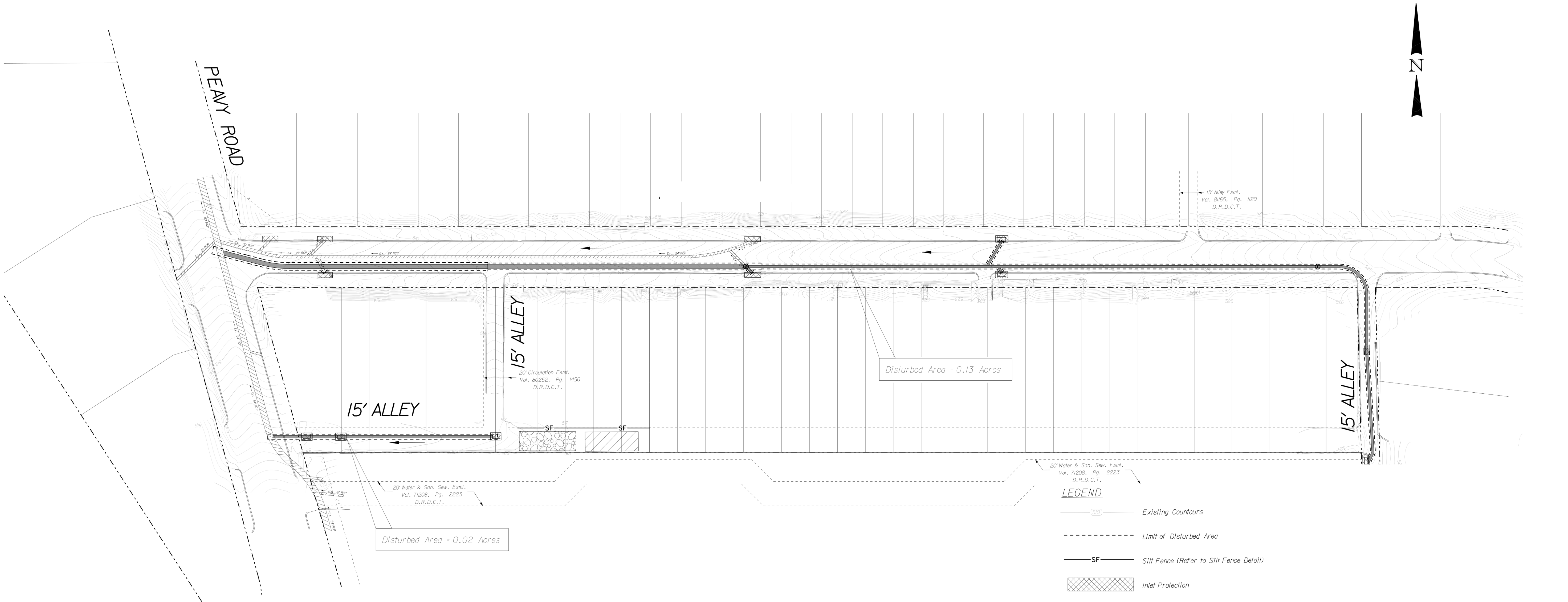


CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

Sample 01 | Sheet 19 of 25

Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party
sheets included for context.



- LEGEND**
- Existing Contours
 - Limit of Disturbed Area
 - SF Silt Fence (Refer to Silt Fence Detail)
 - Inlet Protection
 - Temporary Stone Construction Entrance
 - Contractor Staging Area
 - Rock Filter Dam
 - Flow Direction

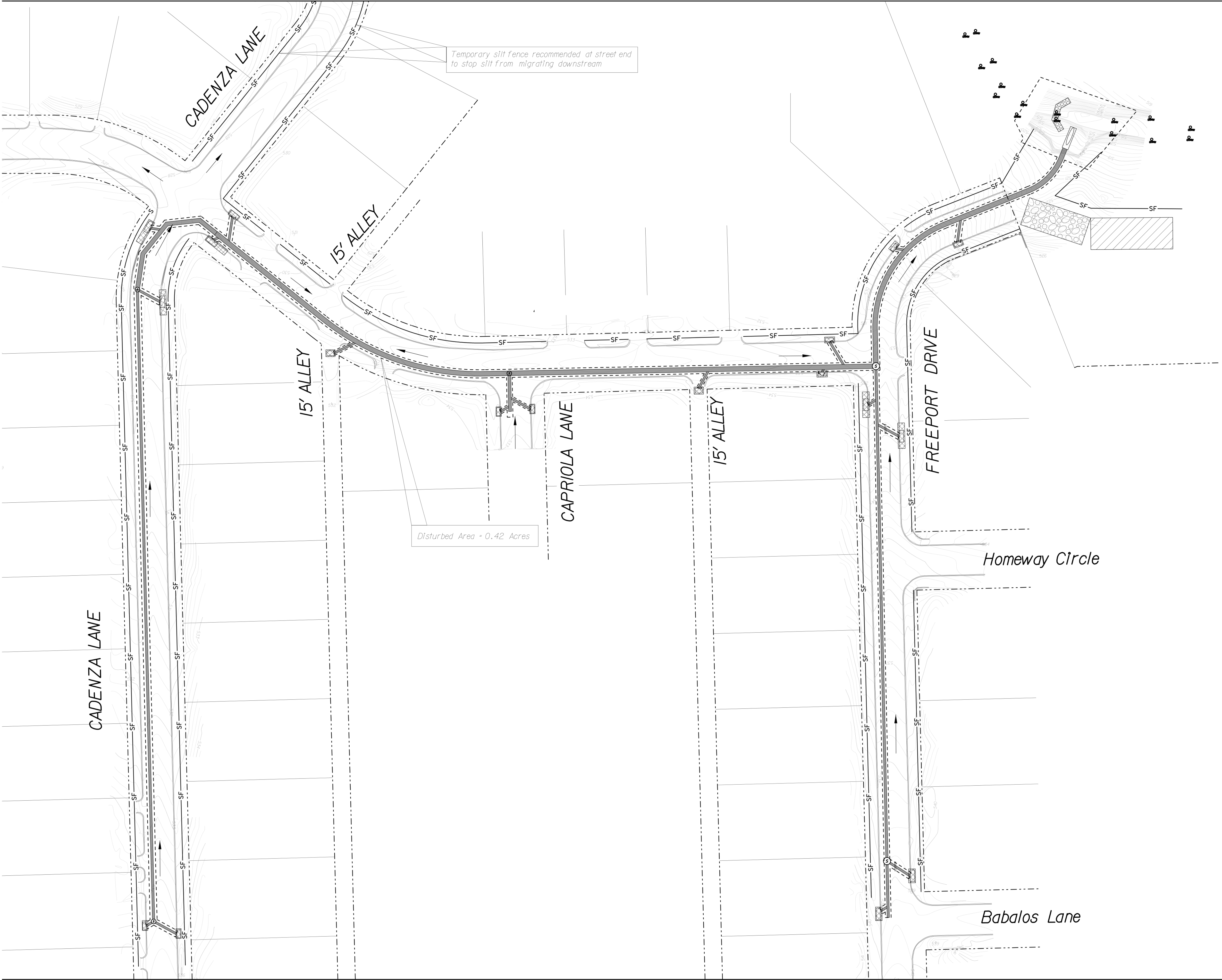
- NOTES:**
1. INLET PROTECTION AND ROCK FILTER DAM TO BE REMOVED UPON COMPLETION OF PAVING AND STABILIZATION OF DISTURBED AREAS AND TEMPORARY CONSTRUCTION ENTRANCE
 2. CONTRACTOR SHALL POLICE SITE REGULARLY AND KEEP SITE FREE OF TRASH AND CONSTRUCTION DEBRIS.
 3. CONTRACTOR SHALL KEEP MUD AND SEDIMENT OUT OF STREET, PARKING LOTS AND DRAINAGE WAYS.
 4. ALL EROSION CONTROL DEVICES SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH CITY STANDARD EROSION CONTROL CONSTRUCTION DETAILS, SHEET 22 ATTACHED.
 5. TOTAL DISTURBED AREA NOT COVERED BY PAVEMENT = 0.57 ACRES (INCLUDES 1 SUGGESTED STAGING AREA/ENTRANCE)
 6. CONTRACTOR TO CALL CITY AT XXX-XXX-XXXX 72 HOURS PRIOR TO CONSTRUCTION FOR LOCATION OF CITY FIBER OPTIC LINE.
 7. ALL DISTURBED GRASS AREAS SHALL BE REPLACED WITH BERMUDA GRASS SOD.

**CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION**

Sample 01 | Sheet 20 of 25

Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party sheets included for context.



LEGEND

- Existing Contours
- Limit of Disturbed Area
- Silt Fence (Refer to Silt Fence Detail)
- Inlet Protection
- Temporary Stone Construction Entrance
- Contractor Staging Area
- Rock Filter Dam
- Flow Direction

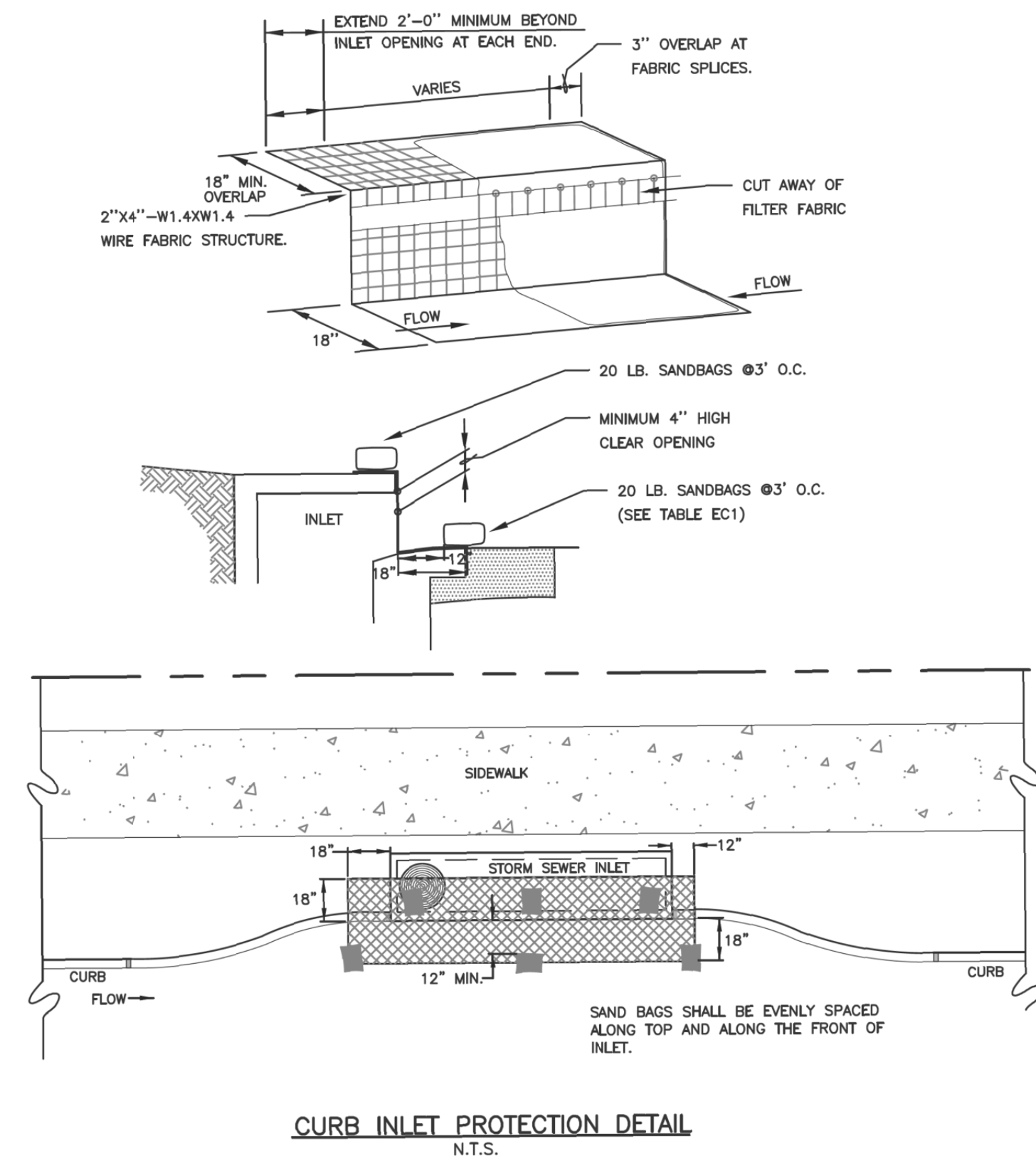
- NOTES:
1. INLET PROTECTION AND ROCK FILTER DAM TO BE REMOVED UPON COMPLETION OF PAVING AND STABILIZATION OF DISTURBED AREAS AND TEMPORARY CONSTRUCTION ENTRANCE.
 2. CONTRACTOR SHALL POLICE SITE REGULARLY AND KEEP SITE FREE OF TRASH AND CONSTRUCTION DEBRIS.
 3. CONTRACTOR SHALL KEEP MUD AND SEDIMENT OUT OF STREET, PARKING LOTS AND DRAINAGE WAYS.
 4. ALL EROSION CONTROL DEVICES SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH CITY STANDARD EROSION CONTROL CONSTRUCTION DETAILS, SHEET 22 ATTACHED.
 5. TOTAL DISTURBED AREA NOT COVERED BY PAVEMENT = 0.57 ACRES (INCLUDES 1 SUGGESTED STAGING AREA/ENTRANCE)
 6. CONTRACTOR TO CALL CITY AT XXX-XXX-XXXX 72 HOURS PRIOR TO CONSTRUCTION FOR LOCATION OF CITY FIBER OPTIC LINE.
 7. ALL DISTURBED GRASS AREAS SHALL BE REPLACED WITH BERMUDA GRASS SOD.

**CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION**

Sample 01 | Sheet 21 of 25

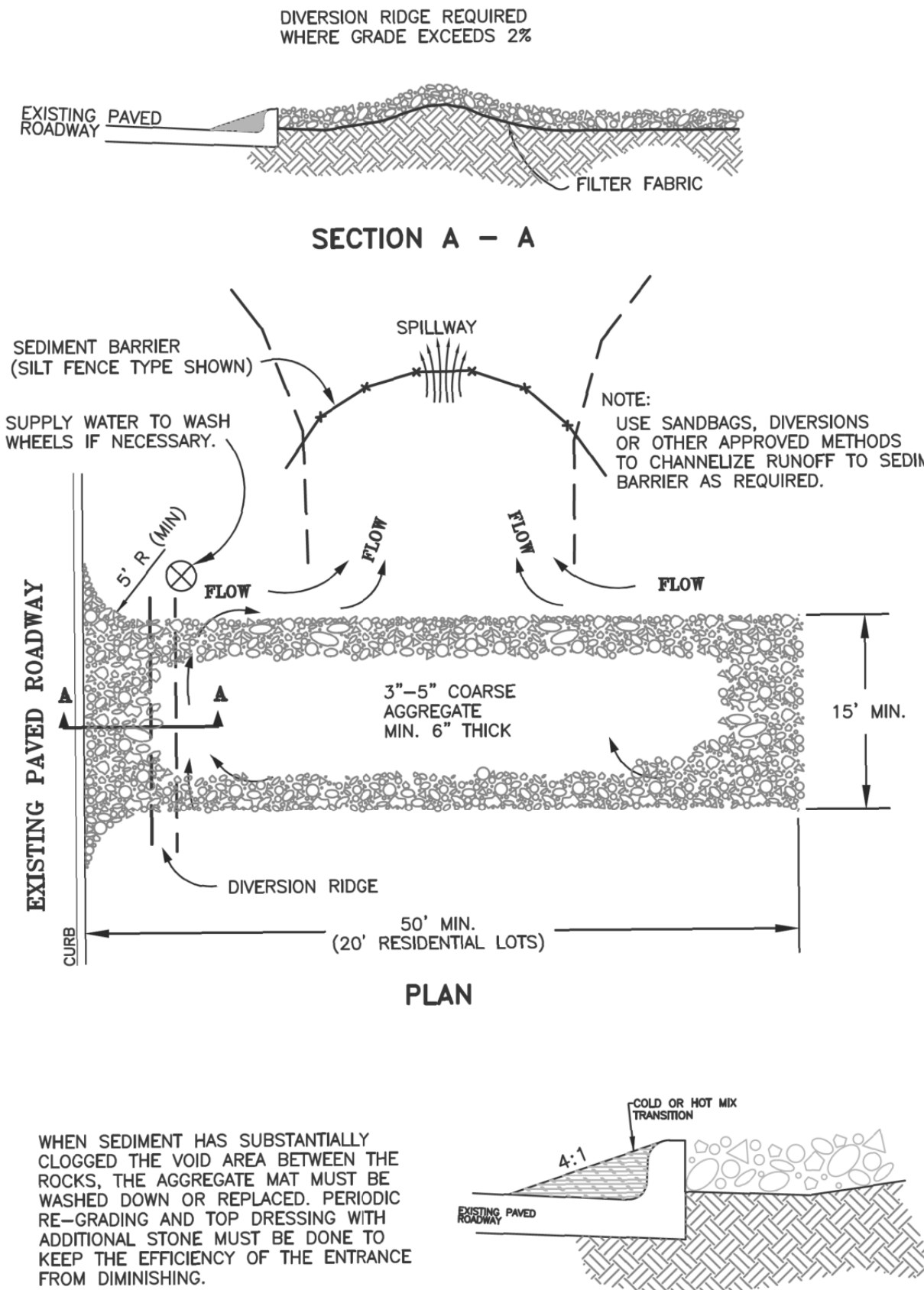
Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party sheets included for context.

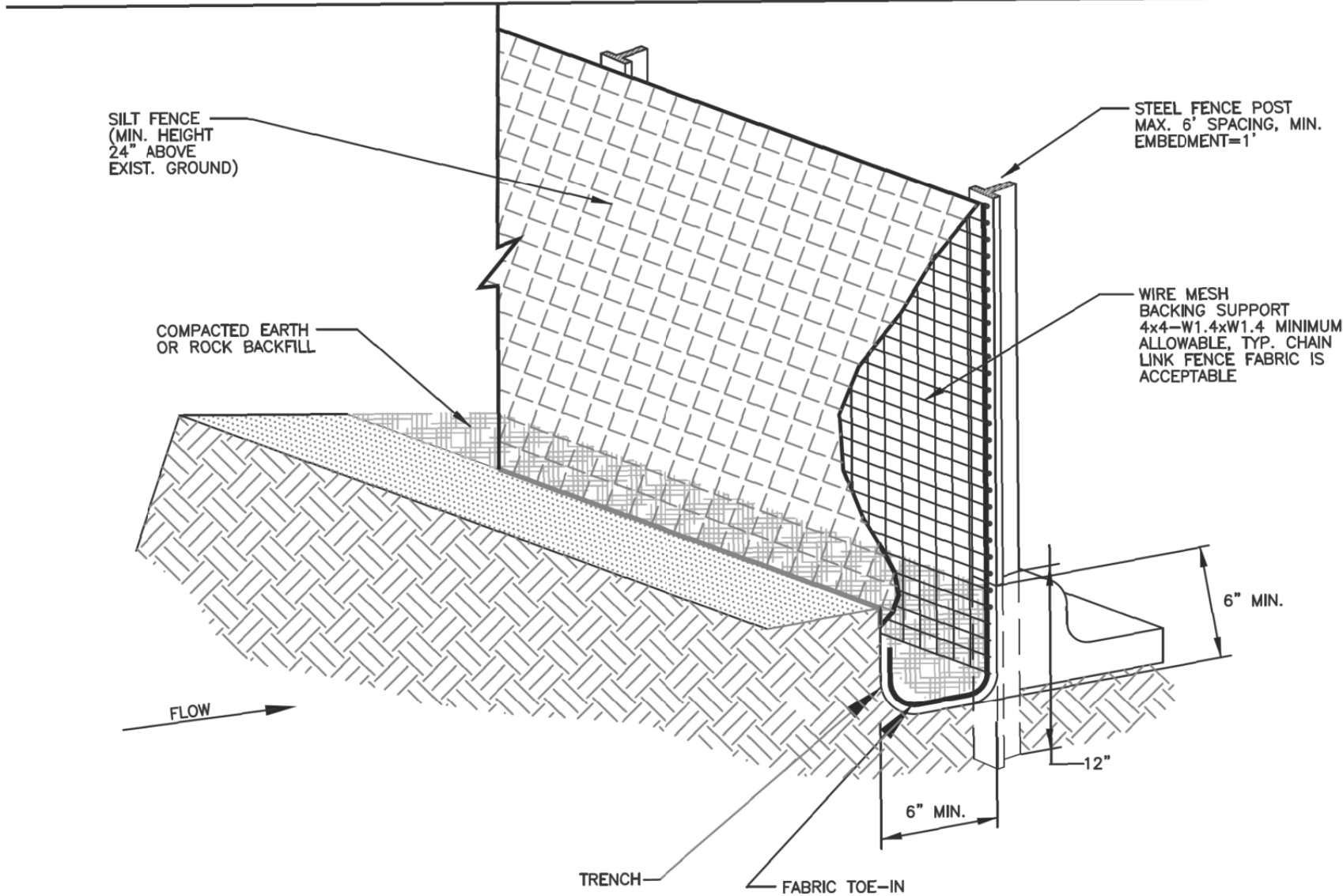


- NOTES:**
1. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL TO PROVIDE A 4" MINIMUM CLEAR OPENING. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
 2. INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2".
 3. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT AND IMMEDIATELY REMOVE THE INLET PROTECTIONS IF THE STORM-WATER BEGINS TO OVERTOP THE CURB.
 4. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

INLET OPENING	MINIMUM NUMBER OF SAND BAGS	
	TOP	FRONT
5'	2	3
10'	3	3
15'	3	4
20'	4	4



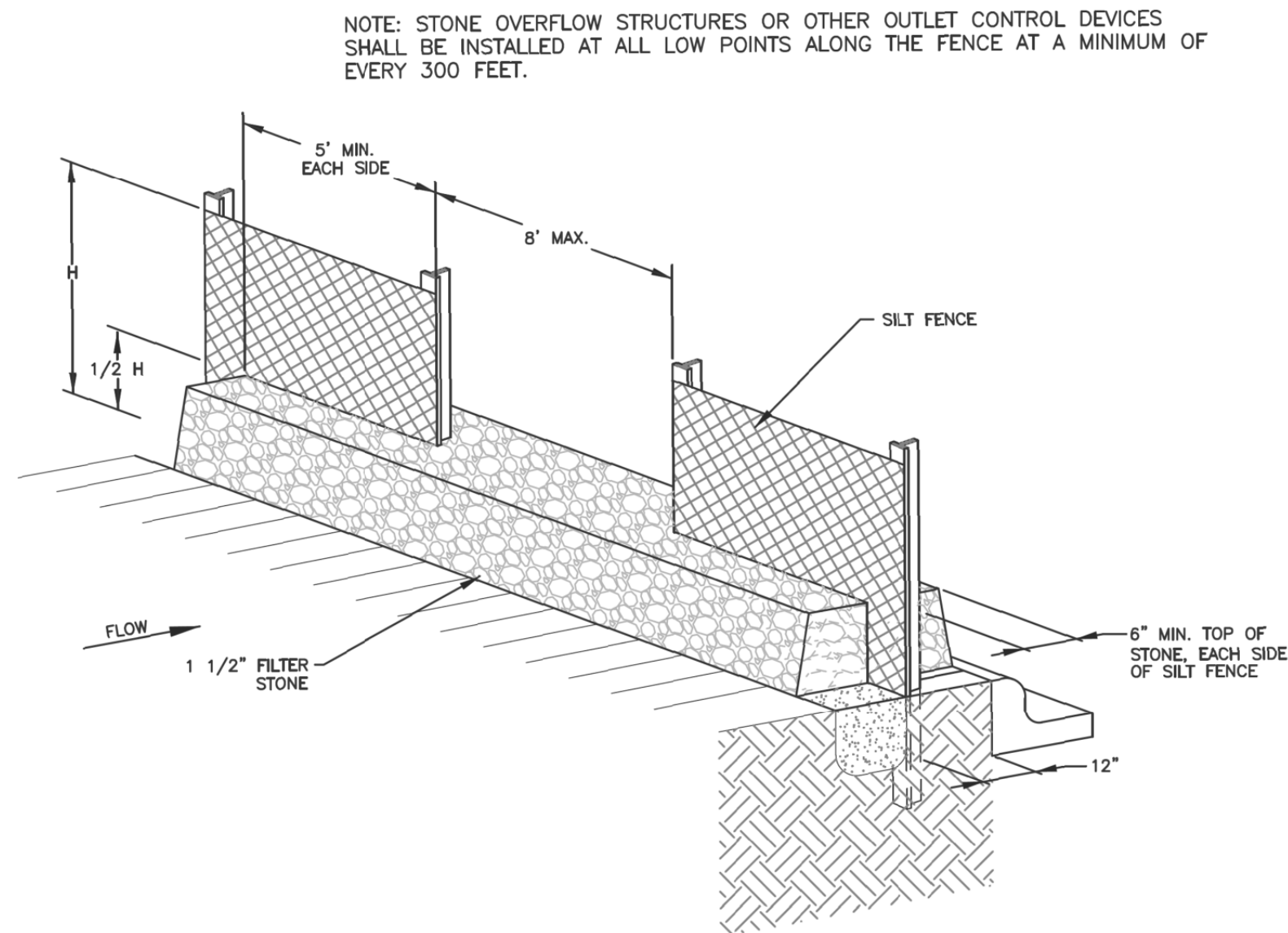
**TEMPORARY STONE CONSTRUCTION
ENTRANCE/EXIT**
N.T.S.



ISOMETRIC PLAN VIEW
N.T.S.

- Silt Fence General Notes**
1. Steel posts which support the silt fence shall be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of one foot
 2. The toe of the silt fence shall be trenched-in with spade or mechanical trencher, so that the down slope face of the trench is flat and perpendicular to the line of flow. Where silt fence cannot be trenched-in (e.g. pavement or rock surface), weight fabric flap with rock on uphill side to prevent flow from seeping under fence.
 3. The trench must be a minimum of 6 inches deep and 6 inches wide to allow for the silt fence fabric to be laid in the ground and backfilled with compacted material.
 4. Silt fence should be securely fastened to each steel support post or to woven wire which in turn is attached to the steel fence post. There shall be a 3 foot overlap, securely fastened where ends of fabric meet.
 5. Silt fence shall be removed when the site is completely stabilized.
 6. Accumulated silt shall be removed when it reaches a depth half the height of the fence. The silt shall be disposed of at an approved site and in such a manner as to not contribute to additional siltation.
 7. Rock filter dam shall be used at concentrated high flow discharge areas in lieu of silt fence.

- Erosion Control Mat Notes**
1. Erosion control mats shall be in compliance with NCTCOG Best Management Practices. Erosion control mats may be used in place of, or in addition to silt fence for sheet flow filtering applications.
 2. Mats shall be installed and anchored securely to the ground in compliance with the manufacturer's recommendations.
 3. The width requirement of the erosion control mats shall be comparable to the width of the disturbed surface to be filtered. The minimum width shall be 10 feet for Single Family lots and 20 feet for Commercial applications, unless otherwise approved from the Storm Water Utility Manager.
 4. The width of erosion control mats can be reduced when used in conjunction with silt fence and block sod vegetative buffer strips. In no applications will erosion control mats be less than 4 feet wide.



**SILT FENCE
STONE OVERFLOW STRUCTURE**

ESTABLISHMENT OF GROUND COVER

1. EIGHTY PERCENT (80%) EVENLY DISTRIBUTED GROUND COVER, WITHOUT LARGE BARE AREAS, SHALL BE ESTABLISHED AFTER THE DESIGNATED AREAS HAVE BEEN COMPLETED TO THE LINES, GRADES AND CROSS SECTIONS SHOWN ON THE PLANS AND PRIOR TO FINAL ACCEPTANCE BY THE CITY ENGINEER.
2. GROUND COVER SHALL BE ESTABLISHED AS PER NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS (N.C.T.C.O.G.) "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" 202.6 SEEDING TURFGRASS. COPIES MAY BE OBTAINED FROM THE "NORTH CENTRAL COUNCIL OF GOVERNMENTS", PO DRAWER 5888, ARLINGTON, TEXAS, 76005-5888, PHONE (817) 640-3300, ALSO AVAILABLE AT WWW.PUBLICWORKS.DFWINFO.COM. A COPY OF THE CONTRACT DOCUMENTS, PLANS AND SPECIFICATIONS SHALL BE AVAILABLE ON-SITE AT ALL TIMES BY THE CONTRACTOR.
3. PRIOR TO PLANTING, CONTRACTOR SHALL PROVIDE THE CITY ENGINEER, OR HIS DESIGNEE, WITH THE STATE OF TEXAS CERTIFICATE STATING ANALYSIS OF PURITY AND GERMINATION OF SEED.
4. PLANTING SEASON AND APPLICATION RATES. ALL PLANTING SHALL BE DONE BETWEEN THE DATES SPECIFIED IN TABLE 1, FOR EACH GRASS TYPE EXCEPT WHEN SPECIFICALLY AUTHORIZED IN WRITING. THE SEEDS PLANTED PER ACRE SHALL BE OF A TYPE SPECIFIED WITH THE MIXTURE, RATE AND PLANTING DATES AS SHOWN IN THE TABLE 1, OR AS SPECIFIED BY THE ENGINEER.

Table 1. Seeding Turfgrass		
TYPE	PLANTING SEASON	SEED AND RATE
TYPE I	MARCH THROUGH SEPTEMBER	BERMUDA GRASS, HULLED 50-LB (22.7-KG) PLS ¹ PER ACRE
TYPE II	OCTOBER THROUGH FEBRUARY	RYE GRASS, 100-LB (45.4-KG) PLS PER ACRE COMBINED WITH BERMUDA GRASS, HULLED 20-LB (9.1-KG) PLS ¹ PER ACRE
OTHER	AS SPECIFIED ON PLANS	AS SPECIFIED ON PLANS

¹PLS = Pure Live Seed is determined by multiplying the gross weight times purity times the germination [For example, a 100-lb bag with 85% purity and 80% germination. (PLS=pounds in bag x Purity x germination) 100 x 0.85 x 0.8 = 60.8 -lbs of pure live seed.]

5. SEEDED AREAS SHALL BE MAINTAINED, INCLUDING WATERING AND MOWING, AT SUCH TIME AND IN A MANNER AND QUALITY TO ESTABLISH A MINIMUM 80% EVENLY DISTRIBUTED GROUND COVER, WITHOUT LARGE BARE AREAS, UNTIL COMPLETION AND FINAL ACCEPTANCE OF THE PROJECT BY THE CITY ENGINEER.
6. IN LIEU OF SILT FENCES, THE CONTRACTOR MAY USE TEMPORARY EROSION CONTROL MATTING AND/OR MULCHING TO STABILIZE DISTURBED SOIL AREA. EROSION CONTROL MATTING AND MULCHING SHALL BE INSTALLED IN COMPLIANCE WITH N.C.T.C.O.G. STANDARD SPECIFICATIONS 201.16 AND 201.17. EROSION CONTROL MATS USED AGAINST PAVED AREAS SHALL HAVE A WIDTH OF NO LESS THAN 10 FEET. NO HAY PRODUCTS SHALL BE USED.
7. ALL MATERIAL INCORPORATED IN THE CONSTRUCTION SHALL BE NEW.

GENERAL NOTES

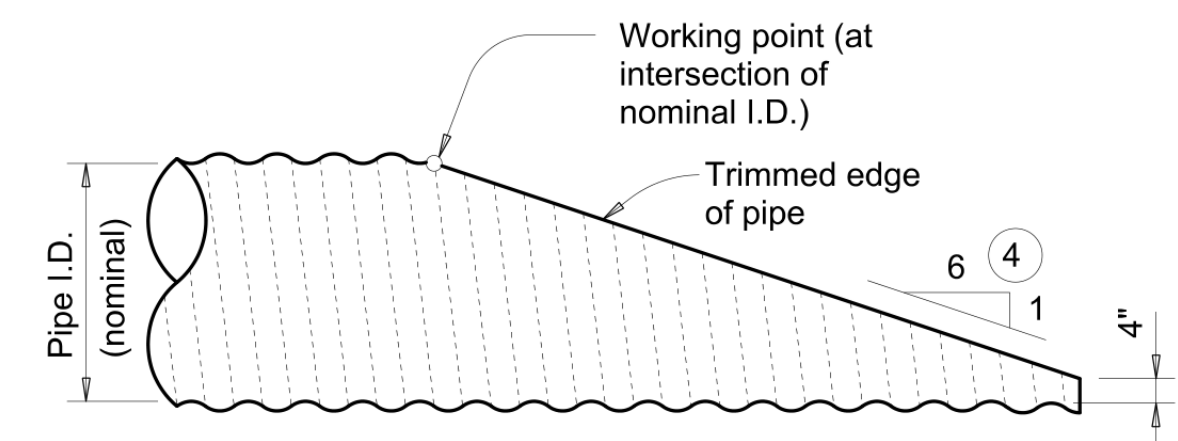
1. INSPECTIONS SHALL BE PERFORMED EVERY 7 DAYS AND ANY REPAIR OR MAINTENANCE ON EROSION CONTROLS AND BEST MANAGEMENT PRACTICES WILL BE MADE PROMPTLY AS NEEDED.
2. NO EXCAVATION OR CURB CUT-BACKS WILL BE ALLOWED WITHIN 18 INCHES OF THE STREET OR CURB WITHOUT APPROVAL FROM THE CITY ENGINEER.
3. STREETS WILL BE KEPT FREE CONSTRUCTION.
4. USE OF ALTERNATE EROSION ADVANCE BY THE STORM WATER EROSION CONTROL PLAN
5. THE REQUIREMENTS OF NCTC SHALL APPLY TO ALL ALTERN THE CITY.

CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

Sample 01 | Sheet 22 of 25

Portfolio reference only.
Not for construction.

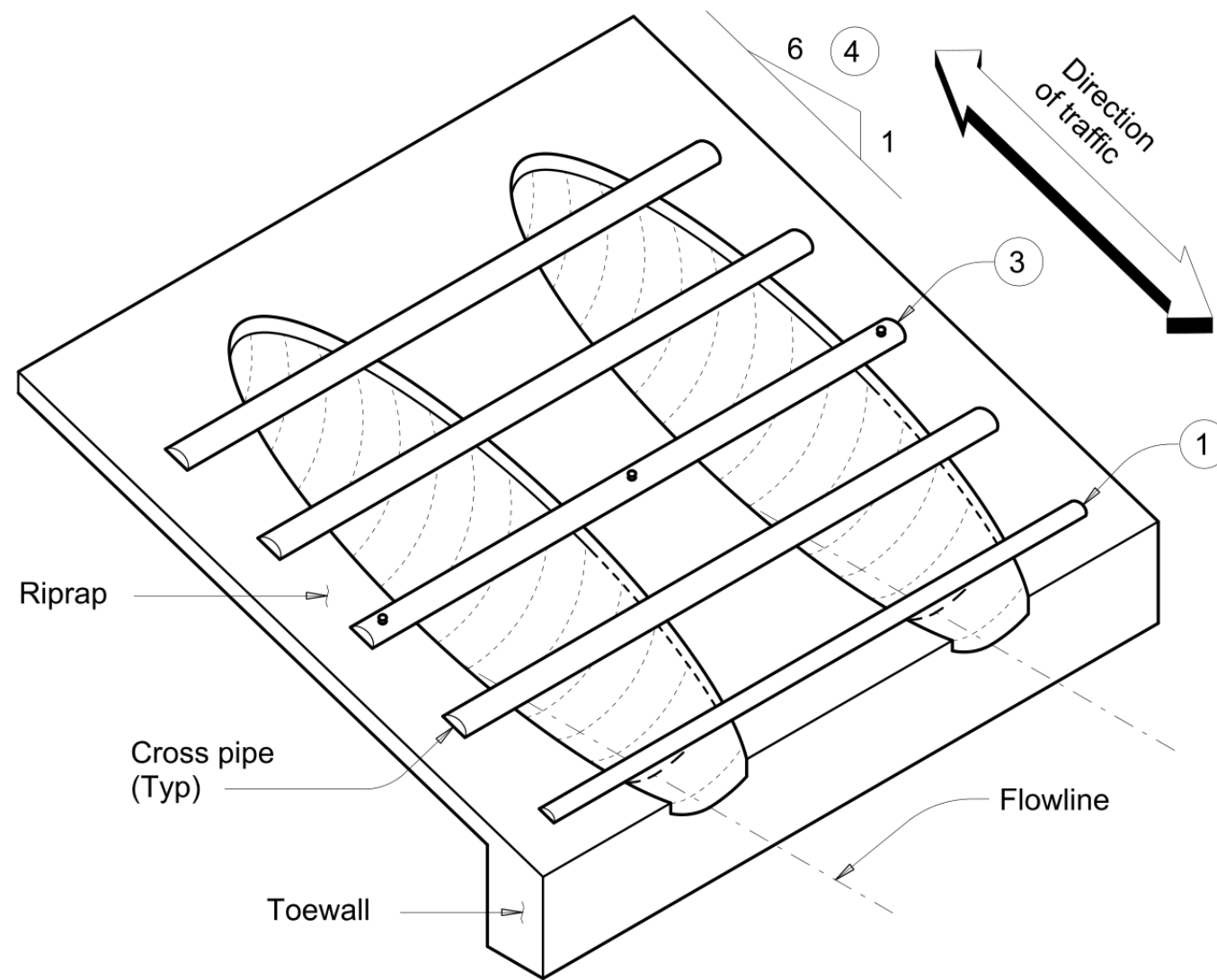
Production support under the client engineering team. Supporting third-party sheets included for context.



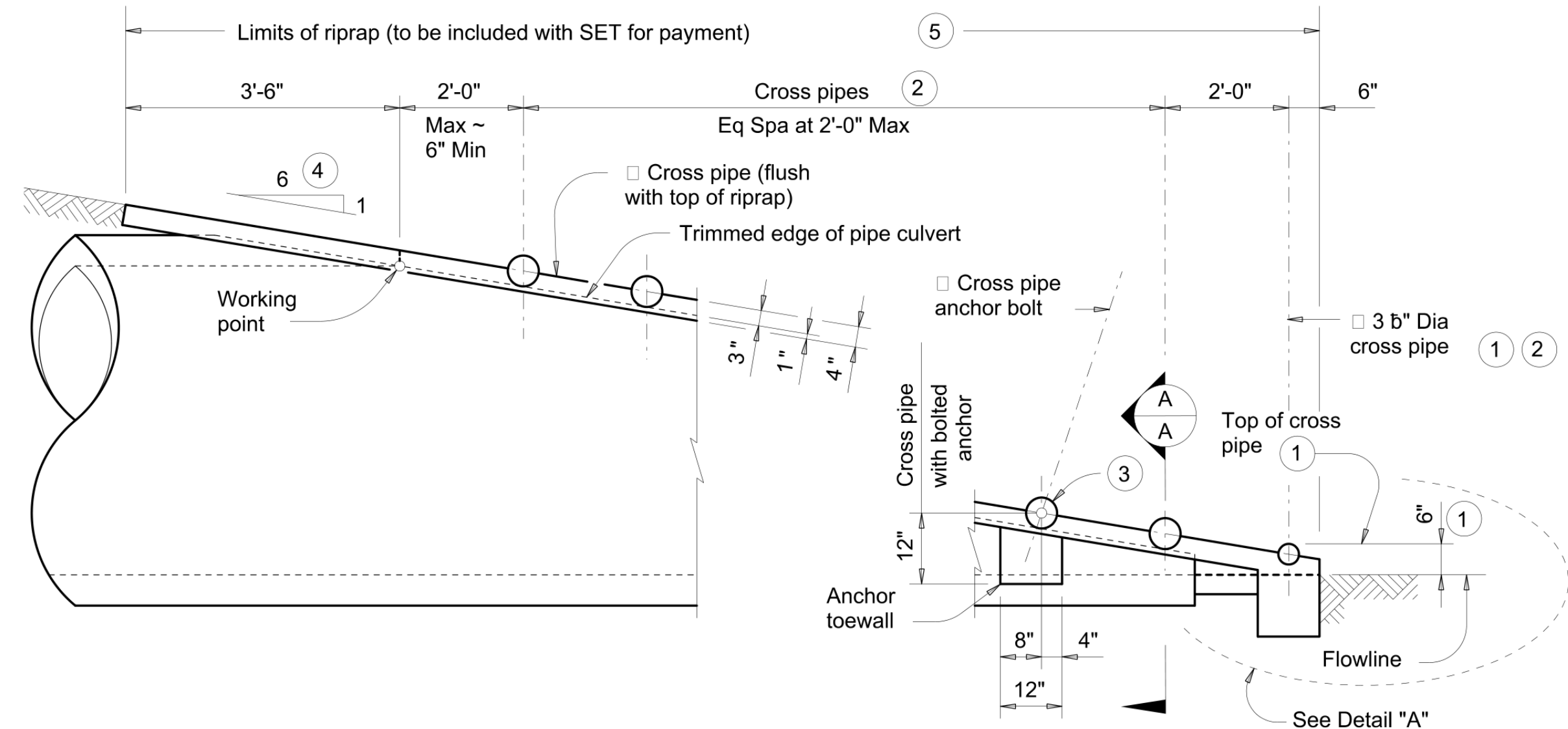
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

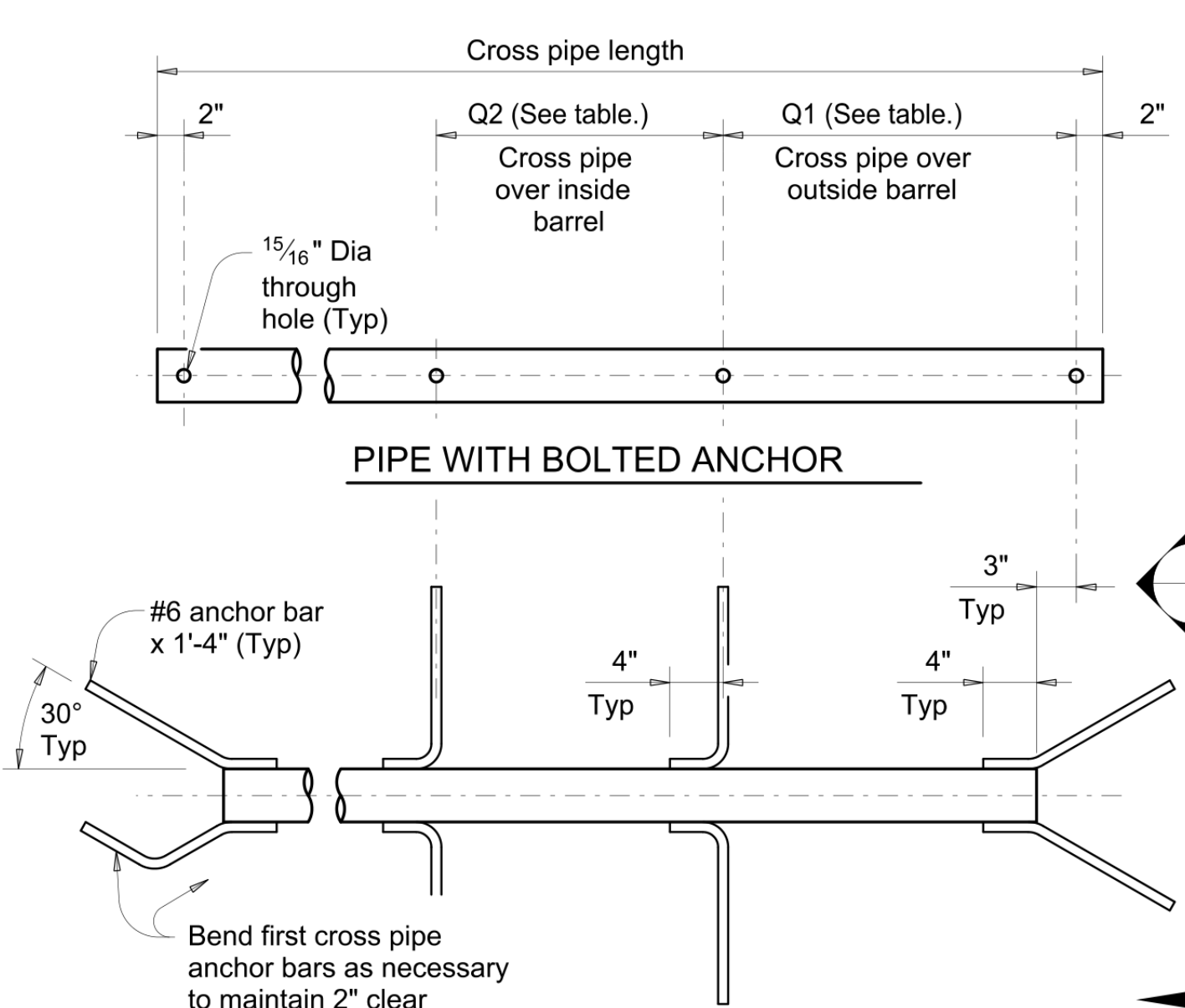


ISOMETRIC VIEW OF TYPICAL INSTALLATION

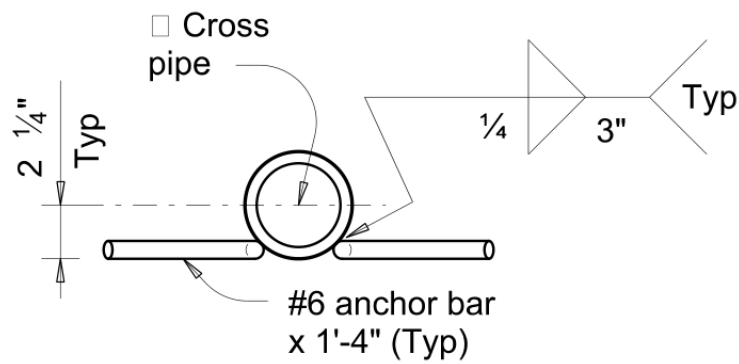


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)

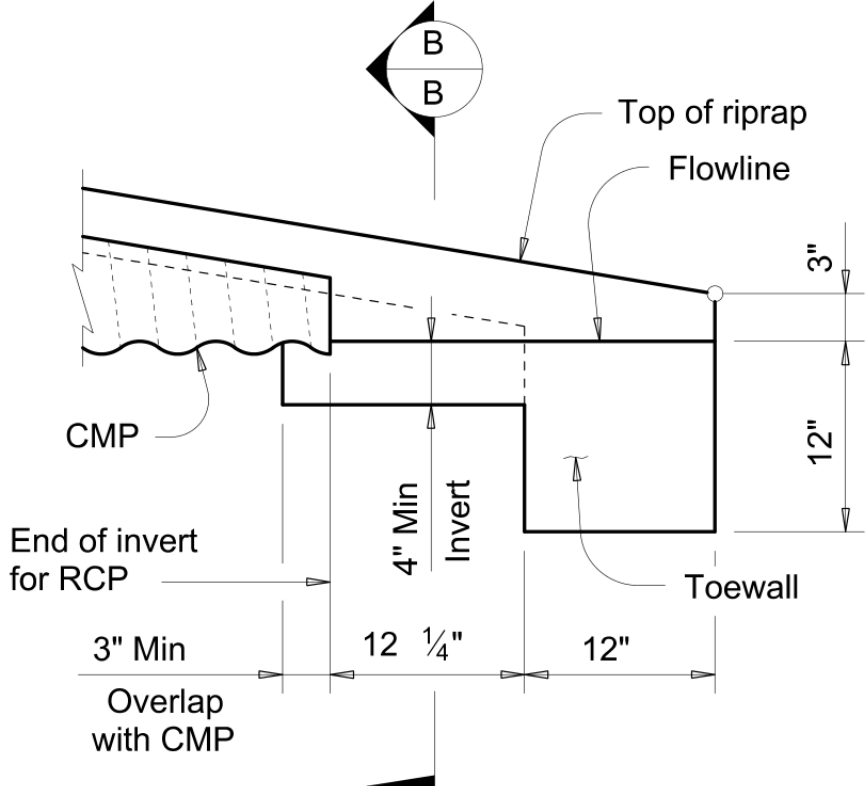


PIPE WITH ANCHOR BARS



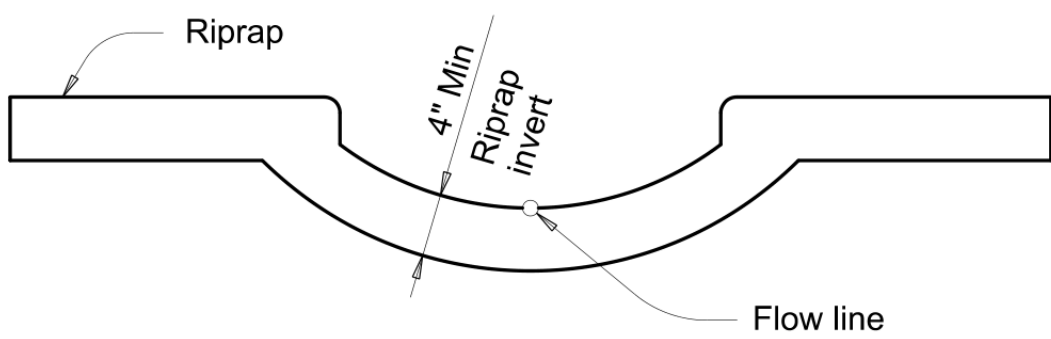
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

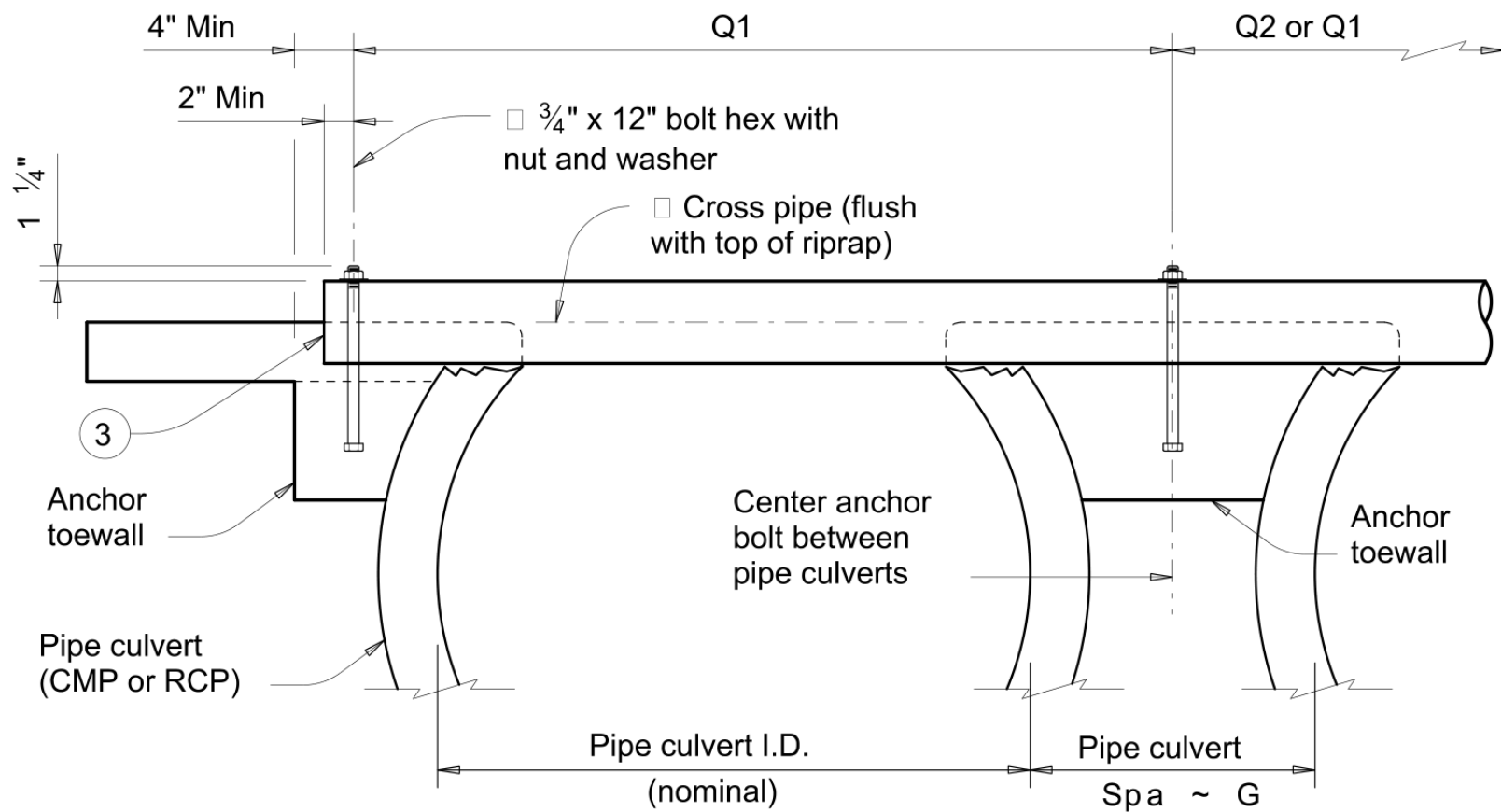
(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

Nominal Culvert I.D.	Conc Riprap (CY)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	2 or more pipe culverts	
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	All pipe culverts	4" Std (4.500" O.D.)
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"		
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	5" Std (5.563" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

- The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
- Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
- Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
- Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
- Riprap placed beyond the limits shown w concrete riprap in accordance with Item 4
- Quantities shown are for one end of one pipe (RCP) culvert. For multiple pipe culv metal pipe (CMP) culverts, quantities will Riprap quantities are for contractor's info

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Material Producer List (MPL) may be use reinforcing in riprap concrete unless note Provide cross pipes that meet the requi (Type E or S, Gr B), ASTM A500 (Gr B), Provide ASTM A307 bolts and nuts. Galvanize all steel components, except fabrication. Repair galvanizing damaged construction in accordance with the spec

GENERAL NOTES:

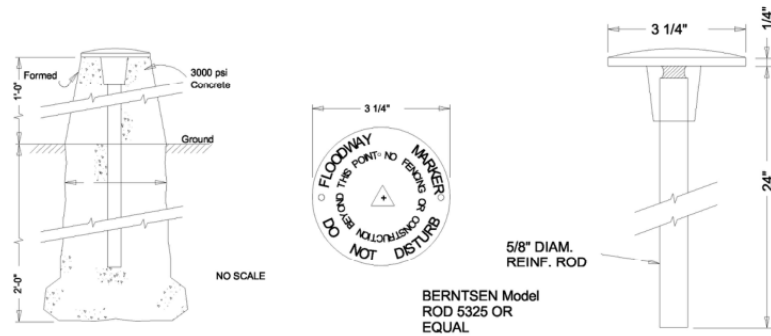
Cross pipes are designed for a traversir pounds at yield as recommended by Res "Safety Treatment of Roadside Parallel-C Texas Transportation Institute, March 19: Safety end treatments (SET) shown her use in those installations where out of co to traverse the openings approximately p cross pipes. Construct concrete riprap and all neces: with the requirements of Item 432, "Ripra Payment for riprap and toewall is includ Bid for each Safety End Treatment.

CIVIL REEL MUNICIPAL CADD PLAN PRODUCTION

Sample 01 | Sheet 23 of 25

Portfolio reference only. Not for construction.

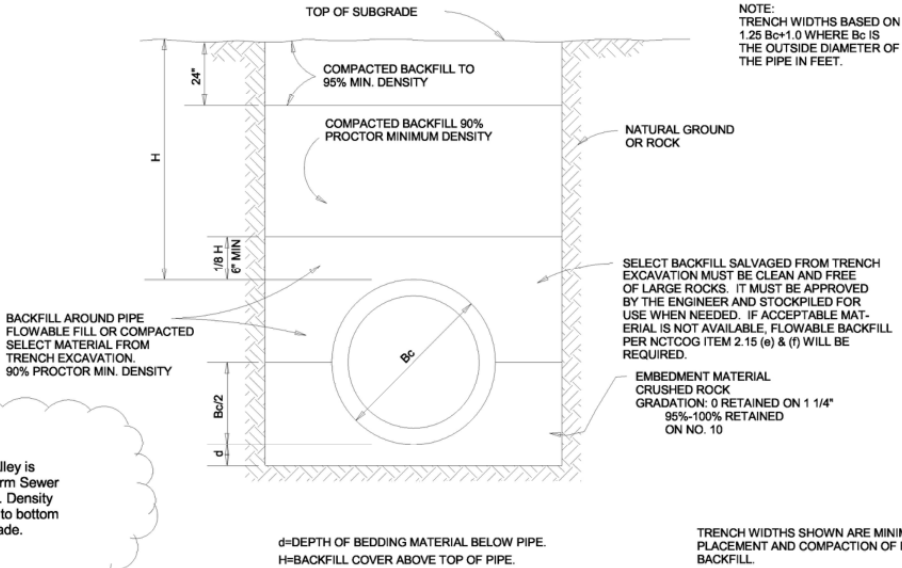
Production support under the client engineering team. Supporting third-party sheets included for context.



FLOOD MANAGEMENT MONUMENT
IN NATURAL GROUND

NOTE:
FOR H>10' DESIGN MUST BE CHECKED. UNLIMITED TRENCH
WIDTH WILL NOT BE PERMITTED FOR CLASS III PIPE AND
HIGHER TYPE PIPE EMBEDMENT MAY BE REQUIRED.

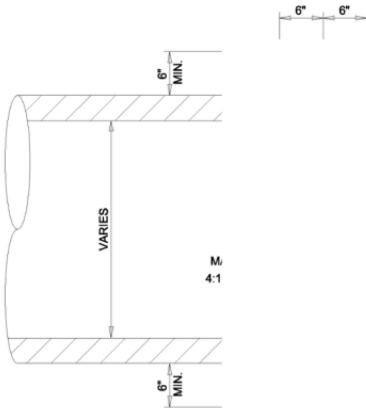
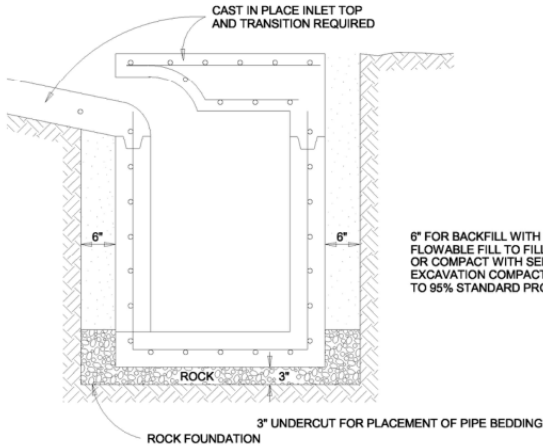
TOP 24" OF BACKFILL MUST BE COMPACTED TO 95% DENSITY
UNDER PAVEMENT. SUBGRADE STABILIZATION UNDER STREET
PAVEMENT SHALL BE COMPACTED TO 98% STANDARD PROCTOR
DENSITY AT + 2% OF OPTIMUM MOISTURE TO THE DEPTH SHOWN
ON THE PLANS AND IN ACCORDANCE WITH THE SPECIFICATIONS.



REINFORCED CONCRETE CLASS III
PIPE INSTALLATION

INSTALLATION WILL BE AS SHOWN OR AS DESCRIBED
IN THE GENERAL SPECIFICATIONS FOR CONSTRUCTION

PREFAB. INLET BOX INSTALLATION



DETAIL OF
FOR E1

CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

Sample 01 | Sheet 24 of 25

Portfolio reference only.
Not for construction.

Production support under the client engineering team. Supporting third-party
sheets included for context.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-4

Project No.: T19027

Client: CITY OF DALLAS

Project: STORM DRAIN

Location: ABSHIRE LANE, DALLAS, TEXAS

Date Started: 09/10/19

Date Completed: 09/10/19

Drilling Co.: GEDCO

Approved By: ARAVIND PEDARLA, Ph.D., P.E.

SAMPLING INFORMATION

Hammer Wt. 140 lbs. Rock Core Dia. N/A
Hammer Drop 30 in. Tube O.D. 3.0 in.
Spoon Sampler O.D. 2.0 in.

DRILLING METHOD(S): Boring advanced using continuous flight auger drilling equipment.

GROUNDWATER INFORMATION: No groundwater seepage encountered during drilling. Boring dry at completion.

DEPTH (FT)

DESCRIPTION OF STRATUM

SOIL SYMBOL

SAMPLES

N: BLOWS/FT
T: BLOWS/INCH
PERCENT RECOVERY/
ROCK QUALITY DESIGNATION

MOISTURE CONTENT (%)

LL

PL

PI

MINUS NO. 200 SIEVE (%)

POUNDS/CU FT
DRY DENSITY

UNCONFINED
COMPRESSIVE
STRENGTH
(TONS/SQ FT)

DEPTH, (FT)

PAVEMENT - 6.0" Asphaltic Concrete

Possible FILL, CLAY, stiff, with limestone fragments (FILL)

T: 100/2.5"

P: 4.5

T: 100/1.5"

LIMESTONE, Weathered, tan, with clayey seams

T: 100/1.0"

LIMESTONE, hard, gray

T: 100/0.75"

Termination of Test Boring at 20.0'

☐ NO RECOVERY

☐ ROCK or PAVEMENT CORE

☒ PRESSED SEAMLESS TUBE

☒ DRIVEN SPLIT SPOON

☒ CONTINUOUS FLIGHT AUGER or BAG SAMPLE

☒ TEXAS CONE PENETROMETER

☐ WATER INITIAL

☐ WATER FINAL

N - STANDARD PENETRATION TEST
P - HAND PENETROMETER
T - TEXAS CONE PENETROMETER
* SEE BORING LOCATION DIAGRAM FOR BORING LOCATIONS

A-4

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-5

Project No.: T19027

Client: CITY OF DALLAS

Project: STORM DRAIN

Location: ABSHIRE LANE, DALLAS, TEXAS

Date Started: 09/10/19

Date Completed: 09/10/19

Drilling Co.: GEDCO

Approved By: ARAVIND PEDARLA, Ph.D., P.E.

SAMPLING INFORMATION

Hammer Wt. 140 lbs. Rock Core Dia. N/A
Hammer Drop 30 in. Tube O.D. 3.0 in.
Spoon Sampler O.D. 2.0 in.

DRILLING METHOD(S): Boring advanced using continuous flight auger drilling equipment.

GROUNDWATER INFORMATION: No groundwater seepage encountered during drilling. Boring dry at completion.

DEPTH (FT)

DESCRIPTION OF STRATUM

SOIL SYMBOL

SAMPLES

N: BLOWS/FT
T: BLOWS/INCH
PERCENT RECOVERY/
ROCK QUALITY DESIGNATION

MOISTURE CONTENT (%)

LL

PL

PI

MINUS NO. 200 SIEVE (%)

POUNDS/CU FT
DRY DENSITY

UNCONFINED
COMPRESSIVE
STRENGTH
(TONS/SQ FT)

DEPTH, (FT)

PAVEMENT - 6.0" Asphaltic Concrete

CLAY, Fat, very stiff, dark brown, wet, with broken limestone (CH)

P: 4.5+

P: 4.5+

T: 100/1.25"

LIMESTONE, Weathered, tan, with clayey seams

T: 100/1.0"

LIMESTONE, hard, gray

T: 100/0.75"

Termination of Test Boring at 20.0'

☐ NO RECOVERY

☐ ROCK or PAVEMENT CORE

☒ PRESSED SEAMLESS TUBE

☒ DRIVEN SPLIT SPOON

☒ CONTINUOUS FLIGHT AUGER or BAG SAMPLE

☒ TEXAS CONE PENETROMETER

☐ WATER INITIAL

☐ WATER FINAL

N - STANDARD PENETRATION TEST
P - HAND PENETROMETER
T - TEXAS CONE PENETROMETER
* SEE BORING LOCATION DIAGRAM FOR BORING LOCATIONS

A-5

Note:
Refer to TSIT Signed and Sealed Geotechnical Report
Dated 04/17/2020

CIVIL REEL
MUNICIPAL CADD
PLAN PRODUCTION

Sample 01 | Sheet 25 of 25

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